

**Space Bureau, the Wireless Telecommunications Bureau, the Office of Engineering and Technology,
the Office of Economics and Analytics and the Office of Managing Director Presentation to
Commissioners**

January 2025 Open Meeting

Panel 4: Focused on the Future of Communications

Presented by:

1. **Julie Kearney**, Chief, Space Bureau
2. **Joel Taubenblatt**, Chief, Wireless Telecommunications Bureau
3. **Ira Keltz**, Acting Chief, Office of Engineering and Technology
4. **Ellen Standiford**, Chief Human Capital Officer, Office of the Managing Director

Joined at the Table by:

5. **Mary Lovejoy**, Auctions, Division Chief
6. **Kerry Murray**, Deputy Chief and Chief of Staff, Space Bureau

Slide 31: Focused on the Future of Communications

Julie Kearney, Chief, Space Bureau

Good morning, Madame Chairwoman and Commissioners. I'm Julie Kearney, Chief of the Space Bureau, and I am honored to be joining you virtually from California. Isn't technology amazing?

I am joined on this panel by my esteemed colleagues, who are seated in front of you:

- Joel Taubenblatt, Chief of the Wireless Telecommunications Bureau;
- Ira Keltz, Acting Chief of the Office of Engineering and Technology;
- Ellen Standiford, Chief Human Capital Officer in the FCC's Office of the Managing Director;
- Mary Lovejoy, Chief of the Auctions Division in the Office of Economics and Analytics; and
- Kerry Murray, Deputy Chief and Chief of Staff of the Space Bureau.

I want to offer my deepest thanks to the Chairwoman, Commissioners, and dedicated FCC staff, for your belief in the future. At the core of our discussions today is what we, as an agency, are doing to enable a world that is innovating faster than we ever could have imagined – and in many realms. The future of communications is on the land, in the sea, and in the stars ... and beyond. Let's talk about my favorite subject: SPACE, the New Space Age, and the FCC's Space Bureau.

Establishing the Space Bureau

With unanimous Commission support and Congressional approval, the Chairwoman officially launched the Space Bureau in April 2023. The Bureau is designed to support United States leadership in the space economy, promote long-term technical capacity to address satellite policies, and improve our coordination

with other agencies on these issues. We were the first telecom agency in the world to establish a Space Bureau -- and the world has taken note.

Let me give you a sense of the dynamic activity in the commercial space and satellite industry. In 2020, there were 104 launches with 1,232 payloads. In 2024, there were 254 launches with 2,541 payloads. Back in 2020, there were just over 2,000 operational satellites in the sky. Today, there are just under 11,000 satellites in orbit. And, here at the FCC, we are seeing a dramatic increase in the number of applications for space and earth stations—applications have been increasing by almost 21% each year since CY 2020.

It's exciting to have a front row seat to the New Space Age. We consistently hear from companies that they are "constantly iterating." They're learning, adjusting, and applying new techniques quickly. Some companies note that there is a lot of engineering and testing, but mostly it's about the experience of "building and doing" that allows them to innovate and improve their capabilities.

Over the last several months, we've seen many new and exciting types of space and satellite services. For example:

In February 2024, a robotic lunar lander set down on the Moon, representing the first lunar landing of an American spacecraft in more than 50 years. The lander is aptly named Odysseus, or "Odie", and it's a public-private partnership between NASA and the U.S. company, Intuitive Machines. Notably, Odie was the Space Bureau's first license for connectivity on the lunar surface!

In September, I was in Southern California and visited a company that is making mineral extraction from asteroids in space a reality. In fact, our OET colleagues granted an experimental license that made them the first company to receive a license from the FCC to operate a commercial mission in deep space.

We've also got earth observation systems from cubesats imaging the earth, detecting methane. The aptly named MethaneSat, launched in March 2024, has been sending back a steady stream of critical data. We licensed that, too.

These exciting developments have implications for other adjacent fields like composite materials research and manufacturing, and effects on other industries like transportation and agriculture, wildfire monitoring, and community resiliency efforts. And speaking of wildfires, our hearts are with everyone impacted by the LA wildfires. As the Chairwoman has noted, the FCC is here to help.

At the FCC, seeing firsthand the wide array of applications for space has helped us think about how we can build frameworks that allow companies to have predictability and flexibility at the same time. Our goal is to make the space economy accessible for a wide range of participants by lowering the cost of entry and bringing in new capabilities that were historically accessible to a smaller pool of stakeholders. We see the government playing a key role in supporting industry's ability to innovate, which leads me to the FCC's adoption of a key framework for a Single Network Future.

Single Network Future

In the Single Network Future, we will connect everyone, everywhere. To do this, we'll need it all – fiber networks, licensed terrestrial wireless systems, next-generation unlicensed wireless technology, and satellite broadband, seamlessly interacting in a way that is invisible to the user. As our Chairwoman often notes, "satellites may be in our skies, but they are the anchor tenant in the Single Network Future."

In fact, in March 2024, the FCC unanimously adopted a new regulatory framework called Supplemental Coverage from Space, that made us the first regulator in the world to issue a framework for connecting

satellites directly to consumer handsets using spectrum previously allocated only to terrestrial service. This rulemaking was a joint effort between the Wireless Telecommunications Bureau, the Office of Engineering and Technology, and the Space Bureau, which worked closely to develop the processes needed to enable these novel collaborations between satellite and terrestrial operators. In November, the Space Bureau issued the first license, and the Wireless Bureau granted the first lease. We also have continued to be heavily engaged in experimental licensing and testing for additional services, and with OIA, involved in the international testing and other approvals. We're eager to move this exciting new service forward – and to serve as an example for other administrations around the world.

Orbital debris mitigation and space sustainability

The FCC has long been active in space sustainability and the need to be a good steward of our space operational environment. Given the rapid growth of the space and satellite industry, it's vital for innovations and investments in space-based services to take sustainability into account.

This year, the FCC celebrated 20 years of its orbital debris mitigation rules. Since the FCC is responsible for licensing non-governmental satellite systems, we require applicants to submit orbital debris mitigation plans so that they are responsible for what goes up, and what comes down. These rules apply to ALL applicants, including those who apply for access to the U.S. market from other countries.

We updated our orbital debris mitigation rules in 2022 to address the surge in new space ventures, and the need to ensure that those ventures work with available space surveillance, space object cataloging, and operator coordination processes to facilitate safe operations. And, we caught the world's attention by shortening from 25 years to 5 years the period of time that FCC-authorized LEO satellites can remain in orbit following the completion of their missions. Our Enforcement Bureau also issued a fine to a company that failed to comply with its orbital debris mitigation plan.

And now, I'll talk about spectrum to support satellite broadband service and novel spectrum use.

At the September 2024 Commission meeting, the FCC took the next big step toward the future of space and opened the 17 GHz band for shared use by satellite systems in geostationary and non-geostationary orbits. This action provided 1300 megahertz of contiguous spectrum to support advanced services, including high-speed broadband access. This will enable LEOs to have greater capacity to support broadband services and low-latency applications like video calls and other real-time applications.

In November 2024, the Commission adopted new rules to support competition and cooperation in spectrum usage by satellite systems. The rules refine the Commission's non-geostationary satellite orbit, fixed-satellite service (NGSO FSS) spectrum sharing regime. Specifically, the rules provide clarity regarding sharing between systems licensed in different processing rounds, granting primary spectrum access to systems approved earlier, while enabling new entrants to participate in an established, cooperative spectrum sharing structure. These updates provide certainty for operators and facilitate innovation in system design, which will ultimately benefit broadband users.

Thank you for the opportunity to highlight the role of the Space Bureau in the future of communications and for your tremendous, unanimous support. I'm pleased to pass the light saber over to Joel Taubenblatt, who will talk about the great work of our Wireless Telecommunications Bureau.

Joel Taubenblatt, Chief, Wireless Telecommunications Bureau

Thank you, Julie. Good morning, Madame Chairwoman and Commissioners.

On behalf of my colleagues in the Wireless Bureau, I am pleased to present highlights of the agency's work to facilitate licensed terrestrial wireless services. And thank you to our Office of Economics and Analytics (OEA) and Office of Engineering and Technology (OET) colleagues, including Giulia McHenry and Ron Repasi, who have collaborated with us on many of these efforts.

Mid-Band Spectrum for 5G

Under the Chairwoman's leadership, we have focused on making additional spectrum available for 5G, particularly in the critical, mid-band range. For example, the Commission completed the service rules for the 3.45 GHz band, which led to OEA's work on an auction of new licenses that raised close to \$23 billion in gross bids. The FCC also auctioned and issued licenses in the 2.5 GHz band and issued licenses in the 3.5 GHz and 3.7 GHz bands. Now, the FCC is moving quickly towards auctioning inventory licenses in the AWS-3 band, which will fund equipment rip-and-replace efforts. Together, these actions are substantially increasing the capacity of wireless networks around the country to the benefit of consumers and businesses.

The Chairwoman further broadened the FCC's mid-band focus to include the 7 - 16 GHz range. This led to the Commission's proposal to repurpose the Upper 12 GHz band for flexible-use wireless services, and to staff's ongoing work with federal partners to explore opportunities in the 7 GHz band. And the Commission looked higher in the frequency range – to the 70/80/90 GHz bands – to adopt rules facilitating 5G backhaul services and access to broadband on aircraft and ships.

The FCC also has emphasized the need for access to 5G-ready spectrum by a wide range of users. The Commission launched the Enhanced Competition Incentive Program, which provides incentives for licensees to provide spectrum access to small carriers, Tribal Nations, and entities serving rural areas. In addition, the FCC's work on the 2.5 GHz Rural Tribal Priority Window has resulted so far in the grant of license applications covering more than 430 federally recognized Tribes and the Native Hawaiian community.

Spectrum for Other Key Purposes

In addition to facilitating 5G consumer broadband services, the Commission has taken a myriad of actions that recognize the importance of spectrum-based services to other key technologies and sectors.

For example, the Commission adopted rules that:

- Enable initial operations of uncrewed aircraft systems in the 5 GHz band;
- Provide additional spectrum in the 2360-2395 GHz band for commercial space launches;
- Ensure that the 4.9 GHz band is efficiently utilized in support of public safety missions nationwide; and
- Promote use of a portion of the 5.9 GHz band for cellular-vehicle-to-everything technology that will facilitate safe and efficient vehicle transportation.

Moreover, the FCC has continued to focus on the use of the 900 MHz band to support the growing demand for private, wireless broadband networks for utilities and other businesses—through the implementation of the broadband transition and the exploration of future possibilities for the band.

Expanding the Tools for Multiple Spectrum Uses to Co-Exist

As the demand for spectrum-based services increases and the supply of spectrum becomes more scarce, the Chairwoman has called on the agency to get creative in examining new ways for multiple spectrum uses to co-exist.

In the 3.5 GHz band, the FCC, NTIA, and Navy worked successfully to expand uninterrupted access to spectrum in areas that cover approximately 72 million more people. In addition, the Commission adopted an NPRM seeking comment on a wide range of potential rule changes to enhance the Citizens Broadband Radio Service for current and future users.

FCC staff, working with federal colleagues, re-energized work on the Lower 37 GHz band to determine how to implement a shared-use framework for federal and non-federal operations. And the Commission initiated a proceeding to examine how spectrum use might be enhanced through new data sources and technologies, such as artificial intelligence.

Thank you so much to the Chairwoman for her stewardship of this agency and to the Commissioners for their support. I am pleased to turn to my colleague, Ira Keltz, to discuss the great work of OET.

Ira Keltz, Acting Chief, Office of Engineering and Technology

Thank you, Joel and Julie. Good morning, Madame Chairwoman and Commissioners.

As noted by my colleagues, the Commission has been busy expanding licensed uses to position the United States for continued global leadership on spectrum use, including 5G and satellite networks as well as 6G. But equally as important, we have also been busy expanding spectrum for unlicensed devices. With low entry barriers, developments in unlicensed devices are often harbingers for what the future may hold for licensed systems. In recent years, the FCC has made groundbreaking decisions in the 6 GHz and 60 GHz bands to unlock that potential. These decisions create an unlicensed landscape unsurpassed across the globe and keeps the United States in its position as a global leader for these critical spectrum resources.

In the 6 GHz band, the FCC expanded access for unlicensed devices to an additional 1,200 megahertz which supports new Wi-Fi 6E devices as well as sets the stage for Wi-Fi 7 and beyond. By permitting low-power indoor, standard-power, and very low power devices, this decision not only supports faster and more reliable connectivity for consumers but also lays the foundation for smart homes, telehealth, augmented reality and virtual reality applications, and next-generation industrial applications. Similarly, the new 60 GHz band rules, expands the universe of unlicensed devices in 14 gigahertz of spectrum beyond simple networking technologies to also deliver new high-tech radar applications such as vehicular safety applications designed to ensure that a child is never again forgotten in the backseat of a car. These rules will also provide for innovative applications for drones as well as other uses.

We've also been setting the stage for the future by adjusting our policies for wireless power transfer applications which can untether devices and lower costs as well as foster innovation by permitting devices to be located in places difficult to connect with a power source. Finally, it's worth mentioning that all of this work is possible through both our robust experimental licensing program and the ongoing efforts to keep the Table of Frequency Allocations updated. Both provide integral support for new technologies and applications—not only those being actively developed, but also the next great ideas that are still in the minds of tomorrow's innovators and creators.

Through strategic allocations and a commitment to innovation, the FCC is not just addressing today's connectivity challenges but is also building the framework for a future defined by seamless, ubiquitous, and intelligent communication.

Thank you to the Chairwoman and Commissioners for their support on these issues.

Ellen Standiford, Chief Human Capital Officer, Office of the Managing Director

Thank you, Ira. Good morning, Madam Chairwoman and Commissioners.

On behalf of Managing Director, Mark Stephens, and my colleagues in the Office of Managing Director, I am pleased to highlight the work of OMD in supporting the accomplishments of the Bureaus and Offices at the FCC.

For example, the Office of Managing Director was proud to take the lead on the reorganization process for establishing the Space Bureau and Office of International Affairs in place of the International Bureau. OMD, and particularly staff in OMD Financial Operations and staff in the Office of Legislative Affairs worked closely together to answer questions and secure approval of the reorganization from the Office of Management and Budget and the FCC's Appropriations Committees.

OMD staff worked closely with the Office of General Counsel to draft the Order, including identifying and updating or revising over 100 FCC rules to account for the reorganization—demonstrating the impact and criticality of the work of the two new organizations. The number of rule changes also required detailed and dedicated coordination between staff in OMD, Office of the Secretary, and the Federal Register to ensure the Order and rules changes were appropriately and timely published.

Once these organizations were launched, OMD staff in Human Resources engaged with our union partners from the National Treasury Employees Union (NTEU) to fulfill the FCC's bargaining obligations and facilitate and process all the required personnel actions to effectuate the new organizations. OMD Administrative Operations ensured that the new organizations had the physical space within the FCC Headquarters to accommodate both teams.

In light of their critical missions and expanded portfolios, OMD then supported the Space Bureau and the Office of International Affairs in leveraging existing talent inside the FCC and attracting and hiring new expertise from outside the agency to join their organizations. For example, since SB and OIA were established, we were able to hire 22 additional staff for those organizations, including 6 engineers to assist in processing the increased number of applications Julie previously mentioned, among other things. We also partnered with Olin College to bring on Whitney Lohmeyer as the FCC's Chief Technologist, who has been invaluable in leading SB efforts and collaborating with OET colleagues, particular on Single Network Future.

Human Resources (HR) worked closely with OGC to leverage the Honors Attorneys Program to provide a pipeline for new attorney talent to both SB and OIA, as well as other Bureaus and Offices across the FCC. Under the Chairwoman's leadership, HR reinvigorated its Honors Engineer Program and expanded its use of the Pathways Intern Programs to build a better pipeline for new talent at the FCC. HR partnered with OET, OGC, and representatives from various FCC affinity groups to attend career fairs at Historically Black Colleges and Universities (HBCUs), identified Hispanic-serving institutions, Veterans-focused career fairs, and Public-Interest career events.

OMD's Enterprise Acquisition Center (EAC) and Office of Chief Information Officer (OCIO) ensured that the FCC had necessary contracts and IT systems in place to support the missions of the Space Bureau

and all other Bureaus and Offices. Both EAC and OCIO have been instrumental in assisting SB, OIA, WTB, and OET in modernizing and maintaining critical license and applications systems such as ICFS, ULS, and the OET Experimental Licensing System.

From the people, the finances, physical space and security, contracts, IT, documentation and to publication of FCC programs and Orders, the Office of Managing Director has supported the critical work of the FCC Bureaus and Offices and thank the Chairwoman and Commissioners for their leadership and support.