



Advanced Spectrum Policy Course

Lecture 2: Federal Spectrum Policy

Fall 2025

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Washington, D.C.



Advanced Spectrum Policy

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Lecture 2: Federal Spectrum Policy

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2.1.1. National Spectrum Strategy 2024

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2.1. National Spectrum Strategy 2024

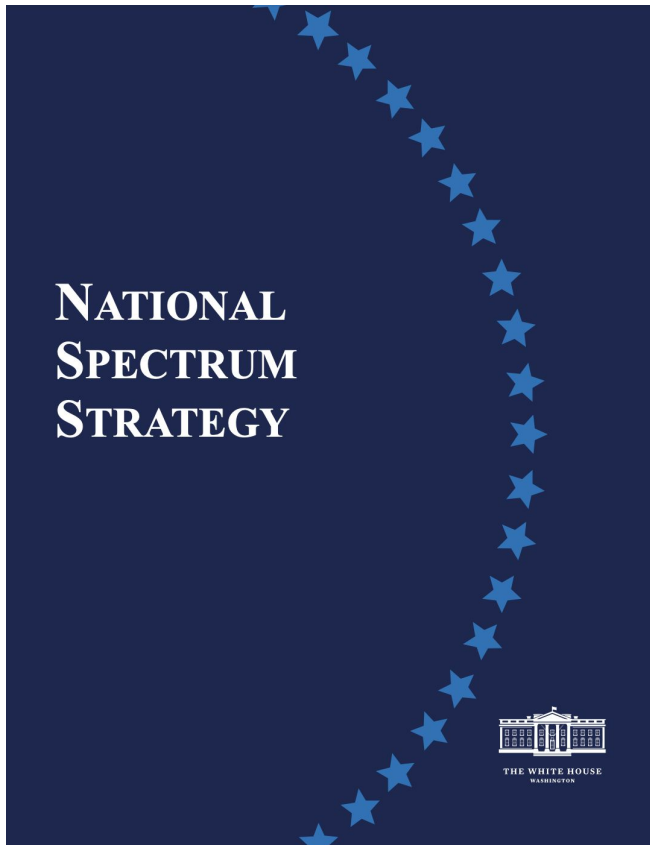
2.1.1. National Spectrum Strategy 2024 (Nov. 13, 2023)

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2.1.1. National Spectrum Strategy 2024 (Nov. 13, 2023)



The National Spectrum Strategy (NSS), prepared by the NTIA under the Biden Administration, is a comprehensive approach to modernize spectrum policy and maintain U.S. leadership in wireless technologies. The NSS emphasizes collaboration between government agencies and the private sector, establishing four pillars focused on creating a spectrum pipeline, long-term collaborative planning, fostering technological innovation in spectrum access and management, and expanding spectrum expertise and awareness.

2.1.1. National Spectrum Strategy 2024 (Nov. 13, 2023)



Table 1: Ongoing Efforts to Study Spectrum Bands	
Focus	Status
Supplemental Coverage from Space	In March 2023, the FCC proposed a new regulatory framework for supplemental terrestrial wireless coverage from space, through which satellite operators and terrestrial providers would coordinate to operate space stations on currently licensed, flexible-use spectrum to expand coverage to the terrestrial provider's subscribers.
5030-5091 MHz	In January 2023, the FCC sought comment on service rules to support safety-critical unmanned aircraft system (UAS) communications links, including control and non-payload communication (CNPC) operations in the band, noting that service rules to facilitate UAS likely will require development in phases.
12 GHz	In May 2023, the FCC took steps to expand the use of 1,050 megahertz of mid-band spectrum by a diverse set of users. Specifically, the FCC ensured that current and future satellite services will be preserved and protected in the 12.2-12.7 GHz band (the "Lower 12 GHz band"), while exploring expanded fixed licensed or unlicensed use of the band. The FCC is further considering options for flexible use of the 12.7-13.25 GHz band (the "Upper 12 GHz band"), which has in-band and adjacent-band federal operations that may need to be protected.
42 GHz	In June 2023, the FCC began the next phase of a proceeding to explore how spectrum in the 42 GHz band (42-42.5 GHz) might be made available through one of several innovative, non-exclusive spectrum access models.
60 GHz	In May 2023, the FCC adopted rules expanding opportunities for unlicensed mobile radar operations in the 57-71 GHz band. The new rules permit mobile field disturbance sensor operations throughout the 60 GHz band and established technical rules for pulse radars. The rule changes also allow unlicensed radars to operate on unmanned aircraft in the 60-64 GHz segment of the band when operated at certain low-flying altitudes.

National Spectrum Strategy, at p. 5,
https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf

2.1.1. National Spectrum Strategy 2024 - 2,790 MHz for further study

- Lower 3 GHz (3.1-3.45 GHz): Pursuant to the Infrastructure Investment and Jobs Act of 2021, the Department of Defense (DoD) has studied the possibility of sharing this 350 megahertz of spectrum with the private sector. DoD's studies helped to determine whether this band should be reallocated for shared Federal and non-Federal use and licensed through auction. DoD determined that sharing is feasible if certain advanced interference-mitigation features and a coordination framework to facilitate spectrum sharing are put in place. The Departments of Commerce and Defense will co-lead any follow-on studies to the Emerging Mid-band Radar Spectrum Study (EMBRSS) that focus on future use of the 3.1-3.45 GHz band. Additional studies will explore dynamic spectrum sharing and other opportunities for private-sector access in the band, while ensuring DoD and other Federal mission capabilities are preserved, with any necessary changes.
- 5030-5091 MHz: The FCC, in coordination with NTIA and the Federal Aviation Administration, is expected to take near-term action to facilitate limited deployment of UAS in this band. Thereafter, this 61 megahertz of spectrum will be studied so that the FCC can optimize UAS spectrum access across the band while avoiding harmful interference to other protected in-band and adjacent-band operations.
- 7125-8400 MHz: This 1,275 megahertz of spectrum will be studied for wireless broadband use (on a licensed and/or unlicensed basis), though some sub-bands eventually may be studied for other uses. There are, however, a variety of mission-critical Federal operations in this band (including Fixed, Fixed Satellite, Mobile, Mobile Satellite, Space Research, Earth Exploration Satellite, and Meteorological Satellite services) that will make it challenging to repurpose portions of the band while protecting incumbent users from harmful interference.

National Spectrum Strategy, at p. 6-7, https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf

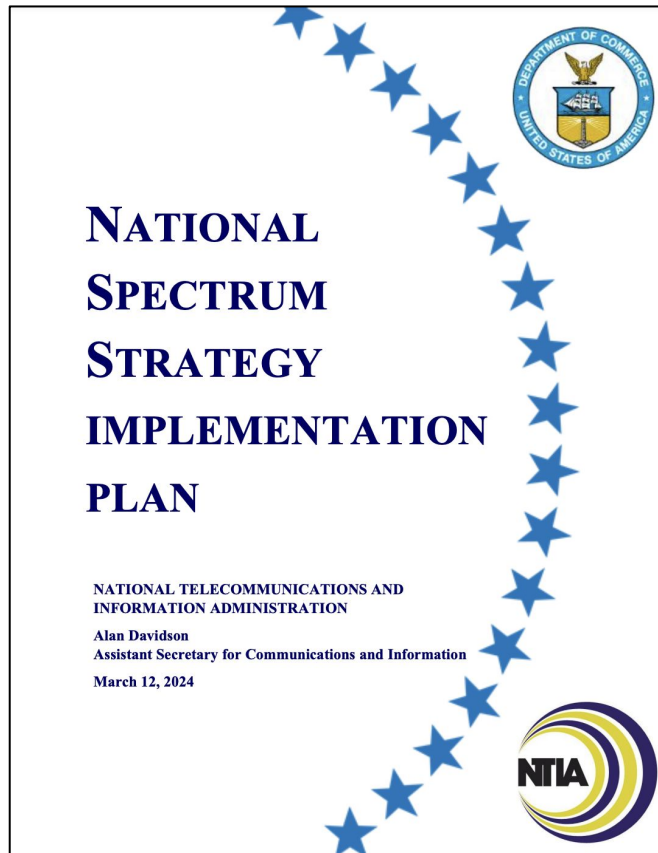
2.1.1. National Spectrum Strategy 2024 - 2,790 MHz for further study

- 18.1-18.6 GHz: This 500 megahertz of spectrum will be studied for expanded Federal and non-Federal satellite operations, consistent with the U.S. position at the 2023 World Radiocommunication Conference (WRC-23), which would add space-to-space allocations to this band (among others). Fixed Satellite Service downlink operations are currently authorized in the band. In addition, non-Federal Fixed Service is authorized in the 18.1-18.3 GHz segment of the band.
- 37.0-37.6 GHz: Building on prior collaborative efforts of NTIA, DoD and the FCC, this 600 megahertz of spectrum will be further studied to implement a co-equal, shared-use framework allowing Federal and non-Federal users to deploy operations in the band.

National Spectrum Strategy, at p. 6-7,

https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf

2.1.2. National Spectrum Strategy Implementation Plan 2024

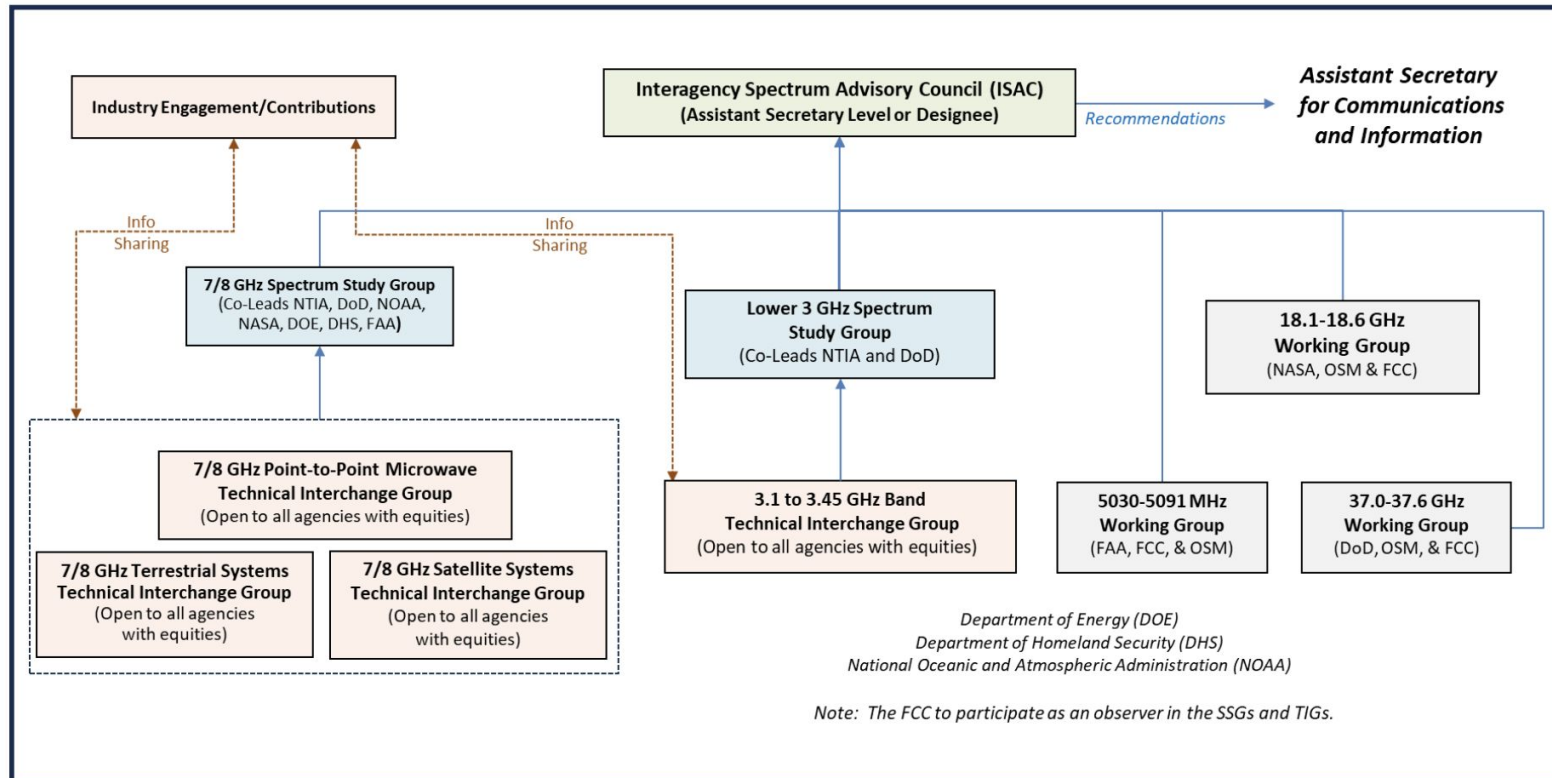


The National Spectrum Strategy Implementation Plan, is a detailed roadmap for achieving the goals outlined in the broader National Spectrum Strategy. It is organized around four key pillars aimed at ensuring U.S. leadership in wireless technologies, fostering long-term collaborative spectrum planning, promoting innovation in spectrum access and management, and expanding expertise in the field.

For each strategic objective within these pillars, the plan identifies specific, measurable outcomes, along with the responsible federal agencies, contributing stakeholders, and estimated timelines for completion, emphasizing a commitment to a transparent and collaborative approach to spectrum management.

2.1.2. National Spectrum Strategy Implementation Plan 2024

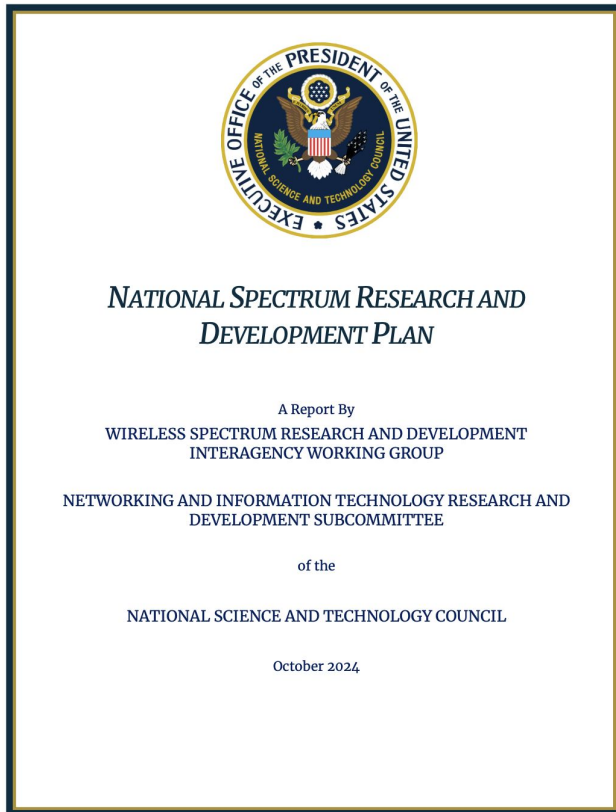
Organizational Structure



National Spectrum Strategy Implementation Plan, Mar. 12, 2024, at p. A-2,

<https://www.ntia.gov/sites/default/files/publications/national-spectrum-strategy-implementation-plan.pdf>

2.1.3. National Spectrum Research & Development Plan



The National Spectrum Research and Development Plan, is the U.S. government's strategy for advancing innovation in the use and management of radio frequencies. Prepared by the Networking and Information Technology Research and Development (NITRD) Subcommittee under the National Science and Technology Council (NSTC), it identifies key research areas and priorities aimed at improving spectrum efficiency and access.

2.1.3. National Spectrum Research & Development Plan

This Plan identifies key opportunities for spectrum-related research and development. Thirteen opportunities were identified as the highest priority.

Highest priority innovation areas for use-inspired research:

- Interference and Noise Resilience
- Interference Impact Prediction
- Sharing with Critical Systems
- Regulatory Options
- Advanced Spectrum Management Processes

Highest priority innovation areas for fundamental research:

- Agile Front Ends and Antennas
- Spectrum Utilization Optimization
- Undesired Signal Prediction
- Spectrum Sharing Control
- Cost of Interference

Highest priority research accelerators:

- Public Datasets
- Testbeds and Testing Frameworks
- Spectrum Technology Readiness Level (TRL) Pipeline Review

Highest priority organizational improvements:

- Researcher Rotations into Regulatory Organizations
- Focused Research to Inform Regulatory Decisions
- Band Studies as Transition Opportunities
- Spectrum Engineering Task Force

National Spectrum Research and Development Plan, Oct. 2024, at v,
<https://www.nitrd.gov/pubs/National-Spectrum-RD-Plan-2024.pdf>.

2.1.3. National Spectrum Research & Development Plan

Spotlight 2.2: Artificial Intelligence and Machine Learning (AI/ML) in Spectrum R&D

AI/ML capabilities are a tool applicable to many of the key innovation areas listed in this National Spectrum R&D Plan. Some potential AI/ML applications include:

Agile front ends and antennas	Accelerate exploration of innovative hardware designs
Receiver interference rejection	Integrate diverse sensed and received data streams, control sophisticated rejection strategies
Millimeter wave and above	Integrate diverse situational awareness data, use it to overcome propagation challenges
Flexible waveform capabilities	Control waveform adaptation, synthesize new waveforms
Reliable service from variable spectrum	Predict imminent changes in spectrum availability
Propagation modeling	Incorporate new information sources such as big-data GIS, foliage maps, high-resolution topography, and building data
Spectrum situational awareness at scale	Interpretation and interpolation of available data streams, control available resources for maximum situation awareness payoff
Spectrum data analysis	Analyze spectrum data in real time to drive automated decisions for efficient spectrum usage
Safe sharing of sensitive information	Generate synthetic data that preserves critical information while obscuring sensitive information
Spectrum sharing control	Detect and respond to failures and attacks
Fast interference management	Detect interference, analyze source, plan response

National Spectrum Research and Development Plan, Oct. 2024, at 13,
<https://www.nitrd.gov/pubs/National-Spectrum-RD-Plan-2024.pdf>.

2.1.3. National Spectrum Research & Development Plan

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National Spectrum Research and Development Plan, Oct. 2024, at 38–39,
<https://www.nitrd.gov/pubs/National-Spectrum-RD-Plan-2024.pdf>.

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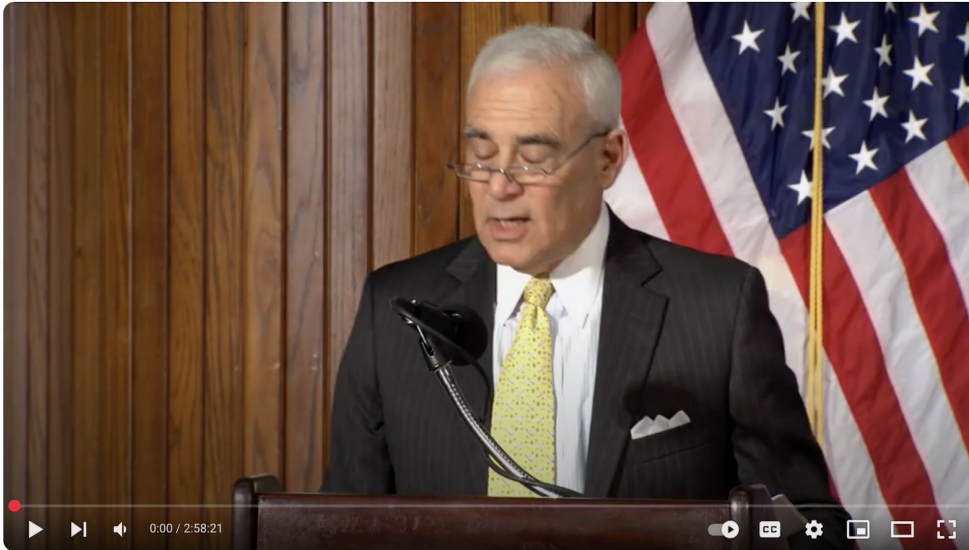
National Spectrum Research and Development Plan, Oct. 2024, at 38–39, <https://www.nitrd.gov/pubs/National-Spectrum-RD-Plan-2024.pdf>.

2.1.3. National Spectrum Research & Development Plan

National Spectrum Research and Development Plan, Oct. 2024, at 38–39, <https://www.nitrd.gov/pubs/National-Spectrum-RD-Plan-2024.pdf>.

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2.1.4. NTIA Spectrum Symposium 2024 (Feb. 1, 2024)



2024 Spectrum Symposium - Morning Session



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The 2024 NTIA Spectrum Symposium focused on implementing the National Spectrum Strategy (NSS), which the White House released on Nov. 13, 2023, along with a presidential memorandum on "Modernizing United States Spectrum Policy and Establishing a National Spectrum Strategy."
...more

<https://www.youtube.com/watch?v=nuDBtpmnoGo>



2024 Spectrum Symposium - Afternoon Session



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The 2024 NTIA Spectrum Symposium focused on implementing the National Spectrum Strategy (NSS), which the White House released on Nov. 13, 2023, along with a presidential memorandum on "Modernizing United States Spectrum Policy and Establishing a National Spectrum Strategy."
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<https://www.youtube.com/watch?v=ssCZx-BIve4>

2.2. Congressional Oversight

2.2.1. U.S. House of Representatives Energy and Commerce Committee,
Subcommittee on Communications

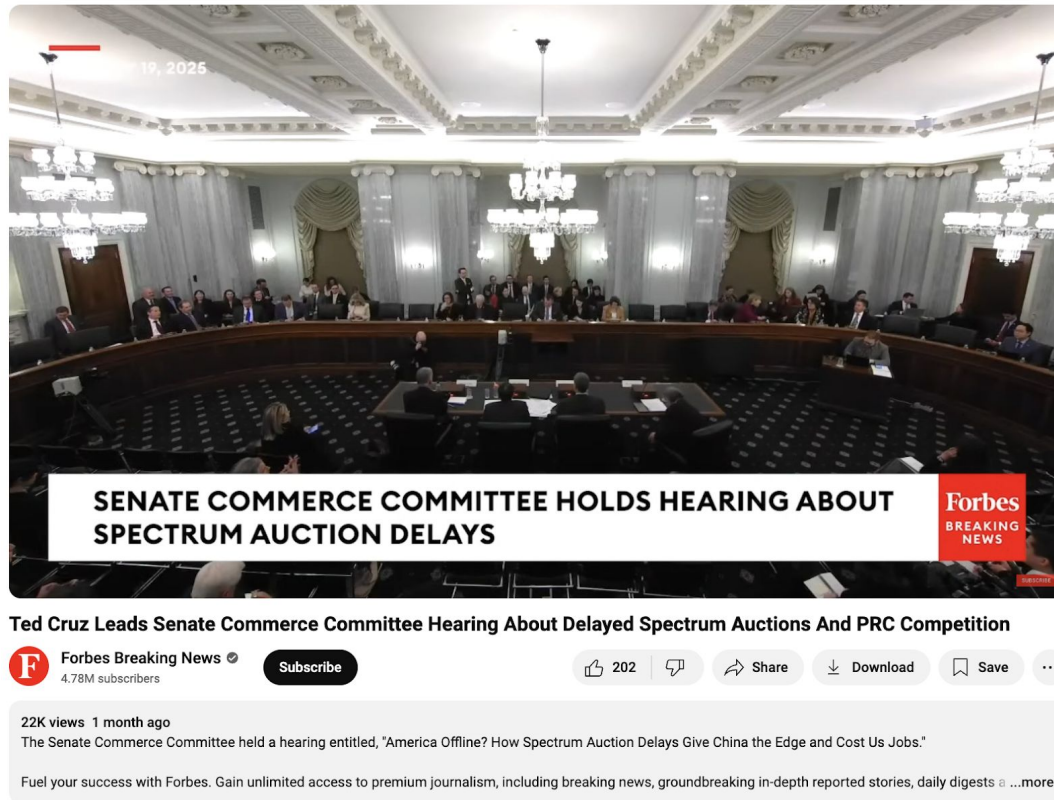
2.2.2. Senate Commerce Committee Subcommittee on
Telecommunications

2.2.1. U.S. House of Representatives Energy and Commerce Committee, Subcommittee on Communications



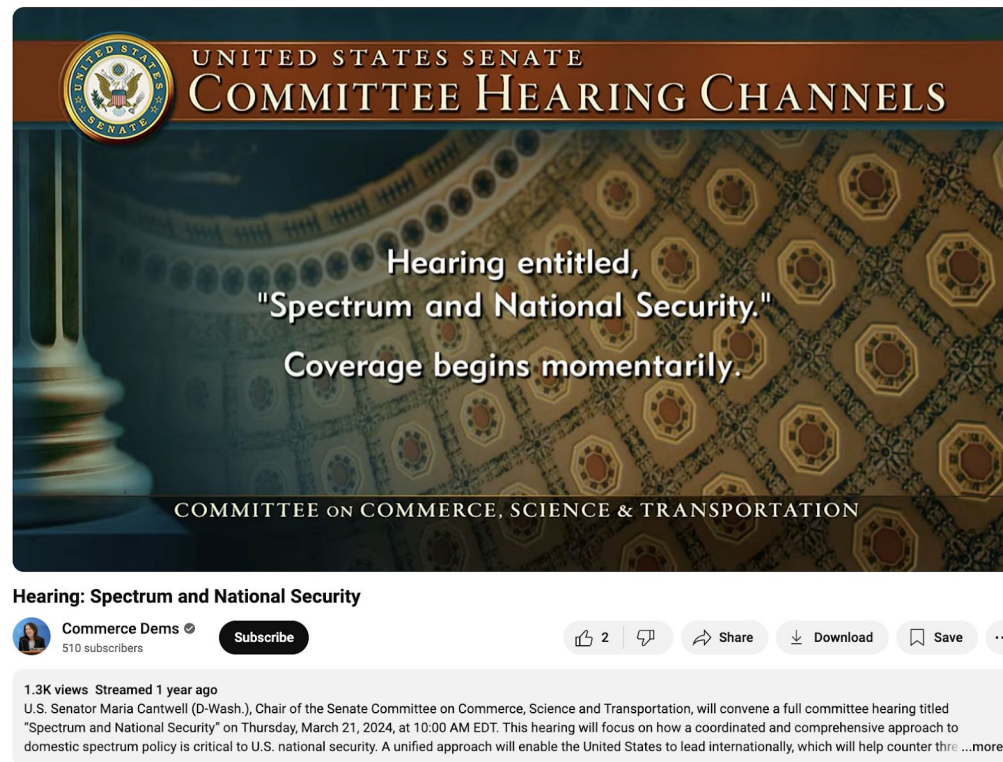
House Committee on Energy and Commerce, “C&T Subcommittee Hearing: Strengthening American Leadership in Wireless Technology.” Jan. 23, 2025, <https://www.youtube.com/watch?v=83sZKRdh94w>

2.2.2. Senate Commerce Committee Subcommittee on Telecommunications



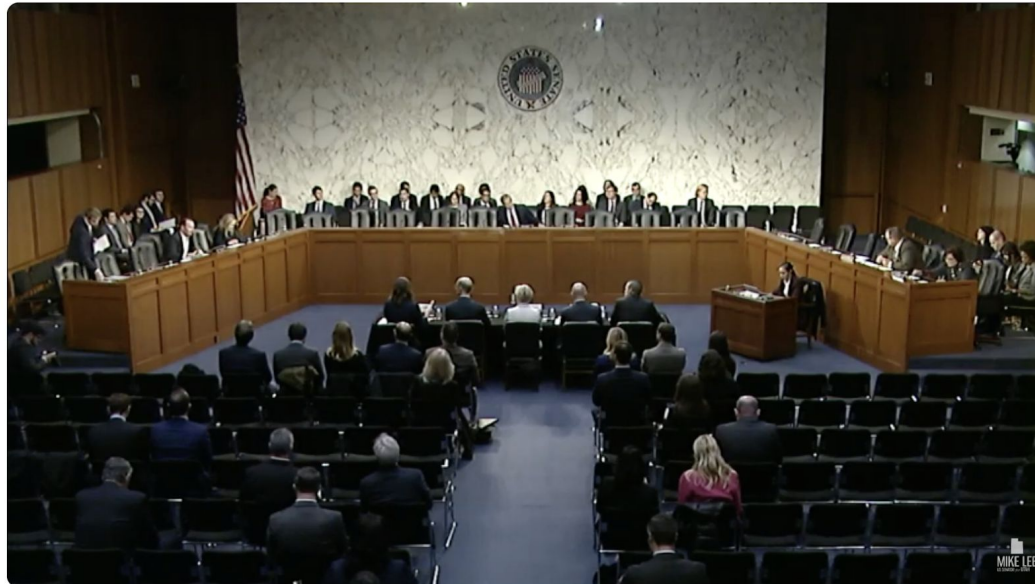
Senate Commerce Committee, Hearing on Spectrum Auction Delays, Feb. 19, 2025,
<https://www.youtube.com/watch?v=jpNPjPHODiU>.

2.2.2. Senate Commerce Committee Subcommittee on Telecommunications



Senate Commerce Committee, Hearing on Spectrum and National Security,
<https://www.youtube.com/watch?v=UUkb3aNygDc>.

2.2.2. Senate Commerce Committee Subcommittee on Telecommunications



Government Control of Mid-Band and Government Spectrum Valuation Act



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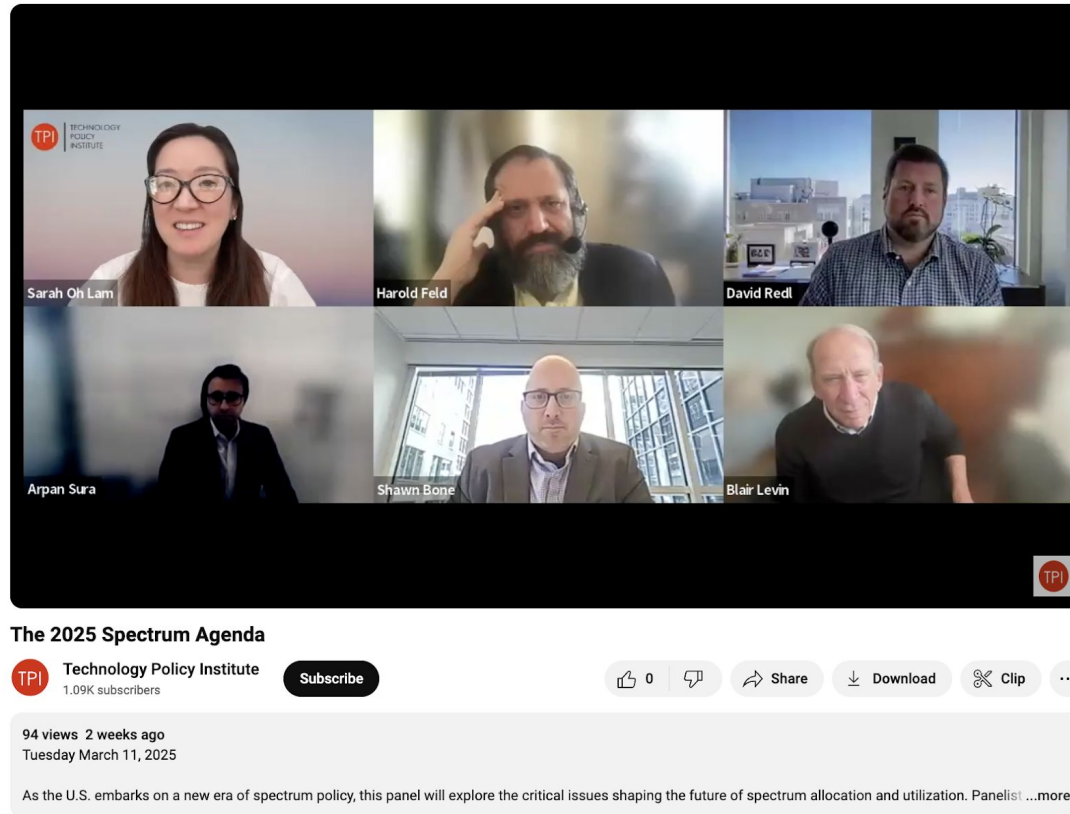
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Senate Commerce Committee Hearing on Mid-Band and Government Spectrum Valuation Act, <https://www.youtube.com/watch?v=I-kqZRXyHjg>.

2.3. Research Institutions



Technology Policy Institute, Panel on the 2025 Spectrum Agenda, Mar. 11, 2025,
<https://www.youtube.com/watch?v=1PEhhqjccEO&list=PLIbOnBe9lRS8gL5lbTtAbu504fVczfuzm>.

2.3. Research Institutions

Spectrum Series 2025

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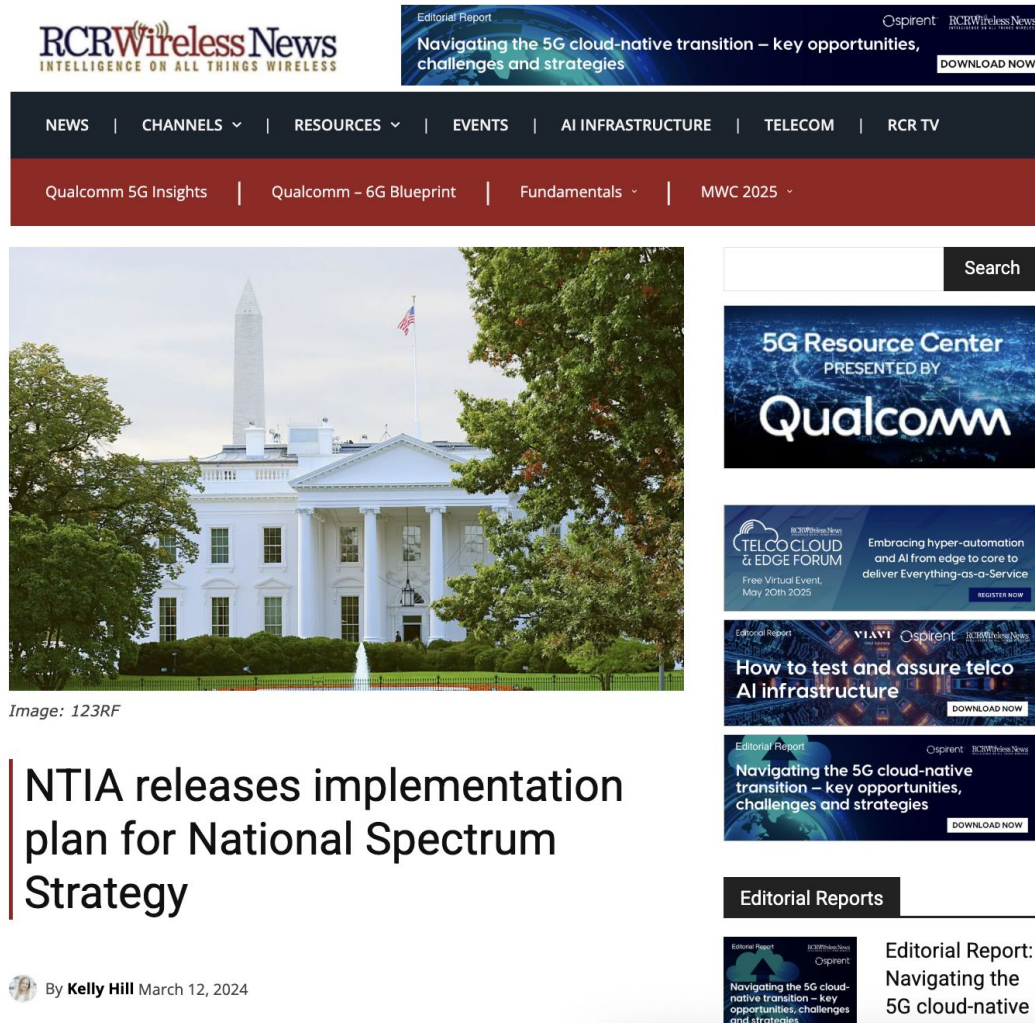
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-  **International Spectrum Leadership**
Technology Policy Institute
-  **The 2025 Spectrum Agenda**
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-  **Federal Spectrum Valuation, Management, and Reform**
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-  **Commercial Space and Spectrum Access**
Technology Policy Institute
-  **Access Models for Current and Future Tech: Frequencies, Power...**
Technology Policy Institute
-  **The Economics of Spectrum Allocation: Beyond Beauty...**
Technology Policy Institute

Technology Policy Institute, Winter Spectrum Series, Panels,
<https://www.youtube.com/watch?v=kbFYWLk8BIg&list=PLIbOnBe9IRS8gL5IbTtAbu504fVczfuzm>.

2.4. In the News



RCR Wireless News
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NTIA releases implementation plan for National Spectrum Strategy

By **Kelly Hill** March 12, 2024

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Kelly Hill, “NTIA Releases Implementation Plan for National Spectrum Strategy,” RCR Wireless, Mar. 20, 2024, <https://www.rcrwireless.com/20240312/featured/ntia-releases-implementation-plan-for-national-spectrum-strategy>

2.5. Assignment

Read the National Spectrum Strategy, Implementation Plan, and R&D Plan. How do you think the federal government will decide on priorities and which bands to release to the commercial sector? Will the process be fast or slow? What do you think about the R&D Plan?

- National Spectrum Strategy, Nov. 13, 2023,
https://www.ntia.gov/sites/default/files/publications/national_spectrum_strategy_final.pdf
- National Spectrum Strategy Implementation Plan, Mar. 12, 2024,
<https://www.ntia.gov/sites/default/files/publications/national-spectrum-strategy-implementation-plan.pdf>.
- National Spectrum Research and Development Plan, Oct. 2024,
<https://www.nitrd.gov/pubs/National-Spectrum-RD-Plan-2024.pdf>.

2.6. Learning Objectives

Analyze the key components of the 2024 National Spectrum Strategy and its implementation, including the roles of federal agencies and Congress in shaping U.S. spectrum policy. Understand how research institutions and oversight bodies contribute to the development and governance of national spectrum initiatives.



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