Regulatory Best Practices for Promoting Emerging Technologies and Next Generation Networks



Ethan Lucarelli Chief, Office of International Affairs Federal Communications Commission United States of America

Note: The views expressed in this presentation are those of the author/presenter and may not necessarily represent the views of the Federal Communications Commission

Introduction to the FCC

The FCC is an **independent** U.S. government agency established by Congress with the Communications Act of 1934.

- Independent of the Executive Branch (directly responsible to Congress, not the President).
- Clearly separated from regulated entities (the United States does not have any government-owned telecommunications companies).

The FCC is a **converged regulator** (telecommunications *and* broadcasting) \rightarrow regulates television, radio, wireline, fixed and mobile wireless, satellite, and cable services in all 50 states plus U.S. territories.

• Mission: "To ensure that all Americans, without discrimination, have available a rapid, efficient, nationwide and worldwide wire and radio communication service with adequate facilities at reasonable charges."

The FCC is both the policy maker and the regulator.



Leadership

- Directed by five Commissioners → appointed by the President and confirmed by the Senate for staggered fiveyear terms.
- The President selects one of the Commissioners to serve as Chair.
- Maximum of three Commissioners from the President's political party at any given time.
- Operates under the "Government in the Sunshine Act."

CHAIRWOMAN



Jessica Rosenworcel

Commissioners



FCC Strategic Goals 2022-2026

1. "100 Percent" Broadband Strategy

Pursue policies to help bring affordable, reliable, highspeed broadband to 100 percent of the country

2. Promote Diversity, Equity, Inclusion, and Accessibility

Work to ensure equitable and inclusive access and facilitate the ability of underserved individuals and communities to leverage and benefit from the wide range of opportunities made possible by digital technologies, media, communication services, and next-generation networks.

3. Empower Consumers

Consumers who are well informed about their rights and what they're buying are more confident and more likely to participate in the digital economy

FCC Strategic Goals, Continued

4. Enhance Public Safety and National Security

Pursue policies to promote the availability of secure, reliable, interoperable, redundant, and rapidly restorable critical communications infrastructure and services.

5. Advance U.S. Global Competitiveness

Promote investment and advance the development and deployment of new communications technologies, such as 5G, that will allow the nation to remain a global leader in an increasingly competitive, international marketplace.

6. Foster Operational Excellence

Be a model for excellence in government by effectively managing resources, maintaining a commitment to transparent and responsive processes that encourage public involvement and decision-making that best serves the public interest, and encouraging a culture of collaboration both internally and across government agencies.

FCC Coordination with Other Government Entities and Stakeholders

Coordinating Spectrum Policy: FCC and NTIA

FCC – regulates and manages nonfederal use of the spectrum, including commercial and noncommercial uses for, e.g., commercial mobile voice and broadband data, various satellite services, TV and radio broadcasting, private radio services, unlicensed communications devices, public safety and other services licensed to the U.S. states and local jurisdictions within the states, and maritime and aeronautical services.

National Telecommunications and Information Administration (**NTIA**), part of the Department of Commerce, manages spectrum allocated for the federal users, such as agencies operating various fixed, mobile and satellite communication systems (like the Department of Defense or Department of Homeland Security), weather/scientific satellites (like the National Oceanic and Atmospheric Administration within Commerce), and the space operations (like National Aeronautics and Space Administration).

Coordination with State and Local Regulators

- State regulators are independent they report only to state governments
- State and local regulators focus on intra-state services that are within their jurisdiction
- FCC, state and local regulators coordinate and work together on a number of issues
 - Intergovernmental Advisory Committee
 - Federal-State Universal Service Joint Board
 - Federal-State Joint Conference on Advanced Telecom Service
- Work closely with Tribal governments to foster comprehensive understanding of FCC programs, policies and decisions and engage them in the FCC consultation process.

Stakeholder Engagement

Federal Advisory Committees provide advice and recommendations on various topics.

Solicit public comment on a broad range of issues.

Regularly conduct workshops, forums and meetings with outside parties.

The Role of Advisory Committees

- Advisory committees help ensure that federal officials have access to information and advice on topics of interest.
 - Played important role in shaping government policies from our country's earliest days.
- Federal Advisory Committee Act (FACA)
 - Law passed In 1972
 - Ensures that advice provided by advisory committees is objective and accessible to the public.
 - Puts in place a process for establishing, operating, overseeing, and terminating advisory committees.
- Today, an average of 1,000 advisory committees with more than 60,000 members advise the President, the Executive Branch, and Independent Agencies on a broad range of issues.
- Federal agencies sponsoring advisory committees must:
 - Publish adequate advance notice of meetings in the *Federal Register*;
 - Open advisory committee meetings to the public (with a few narrow exceptions); and
 - Make records available to the public, including detailed minutes of each meeting.



Regulatory Activities

Rulemaking Overview

- How does it start?
 - $\,\circ\,$ Congress tells us to act
 - $\,\circ\,$ FCC acts on its own motion
 - Petition for Rulemaking-- anyone can seek a rules change
- Procedures must follow applicable laws:
 - $\,\circ\,$ Use notice and comment procedures to $\,$ adopt rule $\,$
 - Notice of Proposed Rulemaking (NPRM) must be sufficient to expose the proposal to public comment and give affected parties an opportunity to develop evidence for their positions.
 - May issue more general Notice of Inquiry (NOI) if not ready to go to NPRM, but cannot proceed directly from NOI to final rule
 - Must publish summary of NPRM and all other rulemaking orders in the Federal Register
 - Must allow "reasonable time" for comments and reply comments
 - The requirements for "notice and comment" generally do not apply to non-legislative, procedural or organizational rules, which the Commission may issue without notice and comment.



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Rulemaking Overview, Continued

- Ex Parte Communications allowed until start of Sunshine Period (one week before agenda meeting) for meeting items or until circulate is released
 Permit-but disclose proceeding: i.e., conv of written or summary of oral, ex part
 - Permit-but disclose proceeding; i.e., copy of written or summary of oral ex parte communication must be filed in the record
- Sunshine Act—substantive discussions among quorum of Commissioners on issue to be decided by FCC must be held in public

 \odot Sunshine Act requires transparency and disclosure in government.

• The Freedom of Information Act (FOIA) protects a citizen's right to request certain information from the federal government. Not all information must be disclosed through the FOIA, such as that pertaining to issues of national security or certain aspects of law enforcement.



Public Trust Safeguards

- Non-public information may not be publicly disclosed, either orally or in writing, without authorization.
- Parties may request confidential treatment or protective orders for competitively sensitive documents.
- Pre-decisional FCC documents and deliberations are non-public / for internal use only, regardless of format.
- Special procedures for highly sensitive information/proceedings.

Regulatory Principles and Strategy



Goal: facilitate a regulatory environment in which market-driven, industry-led innovation can thrive ("virtuous cycle of innovation")

What Is a "Light Touch" Regulatory Approach?

Goal: facilitate an enabling environment in which marketdriven, industry-led innovation can thrive ("virtuous cycle of innovation").

Key elements:

- Regulatory flexibility
- Technological neutrality
- Consumer choice
- Transparency

A light touch approach does **not** mean a lack of government action where needed.

- When no rational business incentives exist in the market, it is the FCC's responsibility to step in to encourage and incentivize investment and deployment.
- Example: universal service.

Principles Meet Strategy: **Designing an** Integrated, Multi-Dimensional, Multi-Faceted, All-Encompassing Approach



What Are Some Key Emerging Technologies?



What Are Critical Issues/Challenges in Rolling Out These New Technologies?



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01

Make more spectrum available. Structure auctions to promote competition.

02



Set clear rules for license use and build out.

Lessons Learned in Regulatory Policy

Promote deployment of service through:

- competition
- strict yet reasonable rules for build out
- universal service support where market forces are not sufficient



Lessons Learned in Network Security

- When 5G and next generation technologies are embedded in almost every aspect of our society and economy—from businesses to homes, hospitals to transportation networks, manufacturing to the power grid—securing our networks will become much more important and much more difficult.
- When it comes to 5G and next gen services, we cannot afford to make risky choices and just hope for the best. We must see clearly the threats to the security of our networks and act to address them.

We'll discuss network security in much more detail in a later session!

Facilitating Infrastructure Deployment: Rethinking the Rules

- 5G isn't just about wireless; we also need strong wired networks to carry all this traffic as well once it's offloaded from the airwaves.
- The FCC is modernizing regulatory rules to encourage the deployment of optical fiber for backhaul to promote the wired backbone of next generation networks.
- The FCC is removing unnecessary regulatory barriers to facilitate rapid deployment of small cells.



Facilitating Infrastructure Deployment: Rules for Siting Wireless Infrastructure



The FCC is modernizing regulatory rules to remove impediments to rapidly deploy wireless infrastructure (including small cells).

State and local governments have authority over zoning and land use decisions, but for wireless infrastructure, they have specific limitations on that authority.

For example, a state or local government:

•may not unreasonably discriminate among providers of functionally equivalent services,

•may not regulate in a manner that prohibits or has the effect of prohibiting the provision of wireless services,

•must act on applications within a reasonable period of time,

•must make any denial of an application in writing supported by substantial evidence in a written record.

Promoting Innovation in Research and Development





In 2013, the Commission adopted rules creating the opportunity for expanded experimentation through Experimental Licenses and Innovation Zones.

Under a Program Experimental License, <u>qualified</u> institutions may conduct testing for multiple non-related experiments under a single authorization within a defined geographic area under control of the licensee and where <u>the licensee has</u> <u>institutional processes to manage and oversee experiments</u>.

The Innovation Zone takes this concept a step further by effectively providing an extension of a Program Experimental License's <u>authorized area of operation</u>. Such licensees are permitted to operate within an Innovation Zone, under the parameters set for that particular Zone, without having to modify their licenses to cover the new location. Innovation Zones can be created in response to a particular request or on the Commission's own motion.

Promoting Innovation in Research and Development, Continued

Spectrum Innovation Initiative

This is a collaboration of the Federal Communications Commission (FCC), the National Telecommunications and Information Administration (NTIA), and the National Science Foundation (NSF).

Key research areas include spectrum flexibility and agility, working towards near real-time spectrum awareness, and improved spectrum efficiency and effectiveness through secure and autonomous spectrum decision-making.



Next G Alliance

Six goals of the 6G Vision:

- Trust, security, and resilience
- Digital world experience
- Cost-efficient solutions
- Distributed cloud and communications systems
- Al-native network
- Sustainability



Federal Communications Commission

ICCENTOLOGICAL

Technological Advisory Council (TAC) 6G Working Group

- Development and deployment of 6G
- Open RAN/vRAN
- Security in Open RAN/vRAN architecture
- Use of mmW/terahertz bands for fronthaul/backhaul/access/sensing
- 6G for autonomous driving, edge computing, emergency alerting, and smart city technology
- 6G for helping bridging the digital divide

 6G Development Timeline 5G Advanced Evolution to continue for future 3GPP Releases (17,18,19) 6G Fundamental research is underway with Federal and Industry Investments ITU defined IMT-2030 and twinning with WRC will set 6G radio performance requirements 	 Spectrum Needs Mid Band: 500MHz opportunity in 7-24 GHz, existing sharing mechanisms Sub Thz: 100-1000GHz for highly demanding use cases: Immersive comms,,cobots Policy is nascent
 O-RAN and Open RAN Security Disaggregated O-RAN Networks need to demonstrate Multi- Vendor Interoperability. Federal incentives need to align with subsystem integration and demonstrate performance parity with legacy networks Securing the Open Fronthaul interface real time system from targeted attacks 	 Heterogeneity of access: Space, Aerial, Terrestrial Integrated Networks requires coordination 6G Use Cases and Application Verticals Focus on application centric view with Multi- sensory and Immersive Communication use cases are quickly emerging
 mmWave and Sub-Thz Opportunity: joint comms and sensing, large transmission bandwidth, indoor and personal area network deployment Challenge: High mid-band value for deployment scenarios, very high path loss Focus on high directionality systems 	 Emergence of Key Value Metrics (KVI) beyond traditional metrics for 5G Focus on zero energy, sustainability, inclusion and deployment economics

Thank You!