

Public Safety and Homeland Security Bureau



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FCC Mission Essential Function

“Ensure continuous operations and reconstitution of critical communications systems and services.”

**Dynamic Spectrum Use in
a Fixed Rule Environment**

Key Priorities

1. Public Safety

2. Outreach

3. Critical Infrastructure

4. Emergency Preparedness

5. Emergency Response

Key Priorities

1. Public Safety

- **Interoperability (OEC Programs & ERIC)**
- **(Increasing) Spectrum Demand:**
 - **D-Block \Rightarrow LTE vs. Wi-Max; National vs. Regional**
 - **Secondary Markets vs. Unlicensed**
 - **“Access” Mile vs. Backhaul**
- **Priority Access vs. Assured Access**
- **Emergency Alert Systems; CMAS & EAS**
- **Next Generation 911 & VoIP 911**

Key Priorities

2. Outreach

- **Partnering with Federal, State, Tribal and Local Authorities**
- **Outreach to Stakeholders**
Including Healthcare Community, First Responders, PSAPs, Service Providers, Associations and User Groups, and Developers of New Technologies.
- **Regional Liaison Specialists**

Key Priorities

3. Critical Infrastructure

- **Network Reliability**
- **Network Outage Reporting System (NORS) & Disaster Reporting System (DIRS)**
- **Best Practices (Federal Advisory Committees)**
- **Cybersecurity (Cybersecurity Roadmap & CSRIC)**

Key Priorities

4. Emergency Preparedness

- **Communications Preparedness for All Emergencies Including Natural Disasters, Pandemics, Criminal or Terrorist Acts**
- **Including Communications Service Providers, Non-Traditional Communications Service Providers, PSAPs, First Responders, Healthcare, Hospitals.**
- **Working With and Support for Federal, State, Tribal and Local Partners.**

Key Priorities

5. Emergency Response

- **Responsible for Commission's Role in the National Response Framework**
- **Provide Expedited Regulatory Relief**
- **Assist with Administering Priority Access Programs (TSP, WPS, GETS)**
- **COOP & COG Operations**

Dynamic Spectrum Use

Background:

1970's Flexible Rules for CMRS - CDMA vs. GSM in licensed cellular bands

1980's Flexible Rules for Spread Spectrum Technologies - 802.11 Stds

1990's Flexible Rules for Unlicensed Spectrum Use

2000's Dynamic Frequency Selection in 5 GHz Band (UNII Band)

TV White Spaces – Spectrum Sensing & Geolocation

Wireless Innovation NOI – 2009 – Efficient Spectrum Use

National Broadband Plan – 2010 – Expanded Broadband Use

Dynamic Spectrum Use

Background:

Software Defined Radio (SDR) Definition and Rules (IEEE Std 1900.1)

“A type of radio in which some or all of the physical layer functions are software defined.”

Commission Definition (47 CFR § 2.1)

“A radio that includes a transmitter in which the operating parameters of frequency range, modulation type, or maximum output power ... or the circumstances under which the transmitter operates in accordance with Commission rules, can be altered by making a change in software without making any changes to hardware components that affect the radio frequency emissions.”

Cognitive Radio Description (IEEE Std 1900.1)

“A type of radio in which communications systems are aware of their environment and internal state and can make decisions about their radio operating behavior based on that information and predefined objectives.”

Promoting Dynamic Spectrum Access

Notice of Inquiry, Adopted 30 NOV 2010, “Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies”

- **Current state of dynamic radios?**
- **What is the current state of equipment and system development?**
- **What private and public deployments are operational today?**

Specifically:

- **What is the state of the art of spectrum sensing?**
(Matched Filter, Signal Detection, Cyclostationary Feature Detection, Cooperative Detection, Interference-based, Geolocation-based)
- **What is the state of the art of interference suppression?**
- **What is the state of the art for propagation modeling?**
- **What is the state of the art for policy radios?**
- **How should dynamic access radios be certified, authorized, compliance tested, and enforced?**

Promoting Dynamic Spectrum Access

Notice of Inquiry, Adopted 30 NOV 2010, “Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies”

- **How can we advance the development and deployment?**

Specifically:

- **What is the state of current access to Commission spectrum data bases?**
- **How can the Commission remove barriers to spectrum use and implement flexible licensing regimes?**
- **How can the Commission encourage “secondary market mechanisms” for opportunistic devices to use spectrum?**
- **How can the Commission implement more viable “real time dynamic auction” practices and “private commons” options for spectrum use?**
- **How can licensed and unlicensed uses be complementary?**
- **What are the most appropriate bands for dynamic access use?**
- **How can the Commission establish “test beds” for developmental purposes?**
- **How can the Commission establish “real-time databases” for spectrum availability?**
- **How can the Commission establish “real-time spectrum monitoring” regime?**

Promoting Dynamic Spectrum Access

Notice of Inquiry, Adopted 30 NOV 2010, “Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies”

- **Dynamic Spectrum Access by Public Safety Community**

Specifically:

- **Can dynamic spectrum access radios be deployed in a seamless manner to replace existing PS radios, including PTT radios?**
- **If so, what would be the best spectrum bands for doing so?**

Promoting Dynamic Spectrum Access

In Summary – how do we break the paradigm of fixed spectrum use in a dynamic spectrum access world?

Federal Communications Commission

Home Page: <http://www.fcc.gov/>



Thank You!

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