

Fire Rescue International

Dallas, Texas
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Current Issues Public Safety Communications What You Need to Know Now

Sponsored By
IAFC Communications Committee

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Public Safety Communications

What You Need to Know Now

PRIORITY # 1

Reliable Agency Specific Voice Communications

Public Safety mission critical every day voice communications within your own agency

PRIORITY # 2

Reliable InterAgency Voice Communications

This is what we commonly refer to as “Interoperability”
Between other agencies and disciplines

PRIORITY # 3

Reliable Data Communications

There is a rapidly increasing need for Public Safety to have access to high speed secure text messaging, documents, photographs, diagrams, streaming video

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Public Safety Communications

What You Need to Know Now

Reliable means whenever public safety personnel need to communicate that **it works !!!!**

1. They can reach the intended public safety personnel directly or through a network (radio towers, base stations, repeaters)
2. There is an available radio channel
3. The radio has power

This is true at all times.

Every day, every hour, and during horrific events, disasters, catastrophes

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Public Safety Communications

What You Need to Know Now

Reliable means that public safety must plan for

- Every day peak service times and large incidents
- Radio system disruptions such as power outages, tower failures, system interconnect failures
- Personal radio equipment failures (electrical/mechanical problems, battery failure, etc.)
- Catastrophic wide area failures of almost everything

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Public Safety Communications

What You Need to Know Now

Who is looking out for the communications interests of the fire service and the public safety community at the national level?

The IAFC Communications Committee

The Coalition for Improved Public Safety Communications (CIPSC)

The National Public Safety Telecommunications Council (NPSTC)

The Executive Committee of the DHS SAFECOM Program

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Association of Public-Safety Communications Officials-International
 International Association of Chiefs of Police
 Major Cities Police Chiefs Association
 National Sheriffs' Association
 Major County Sheriffs' Association
 International Association of Fire Chiefs

Coalition For Improved Public Safety Communications (CIPSC)

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 Communications Advisor, MCC, NSA, MCSA

Alan Caldwell

Government Relations, IAFC

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National Public Safety Telecommunications Council

The Collective Voice of Public Safety Telecommunications

NPSTC Member Organizations

Member Organizations:

- American Association of State Highway and Transportation Officials
- American Radio Relay League
- American Red Cross
- Association of Public Safety Communications Officials - International
- Forestry Conservation Communications Association
- International Association of Chiefs of Police
- International Association of Emergency Managers
- **International Association of Fire Chiefs**
- International Association of Fish and Wildlife Agencies
- **International Municipal Signal Association**
- National Association of State Emergency Medical Services Officials
- National Association of State Foresters
- National Association of State Telecommunications Directors

Liaison Organizations:

- Federal Communications Commission
- Federal Partnership for Interoperable Communications
- National Telecommunications and Information Administration
- Telecommunications Industry Association
- U.S. Department of Agriculture
- U.S. Department of Homeland Security,
 - Federal Emergency Management Administration
 - SAFECOM Program
- U.S. Department of Interior
- U.S. Department of Justice
 - CommTech Program

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How is NPSTC organized?

NPSTC's Governing Board

Representatives from each of its member organizations

Executive Committee

The Executive Committee comprises a Chair, two Vice Chairs, and the four Committee Chairs

Four Committees

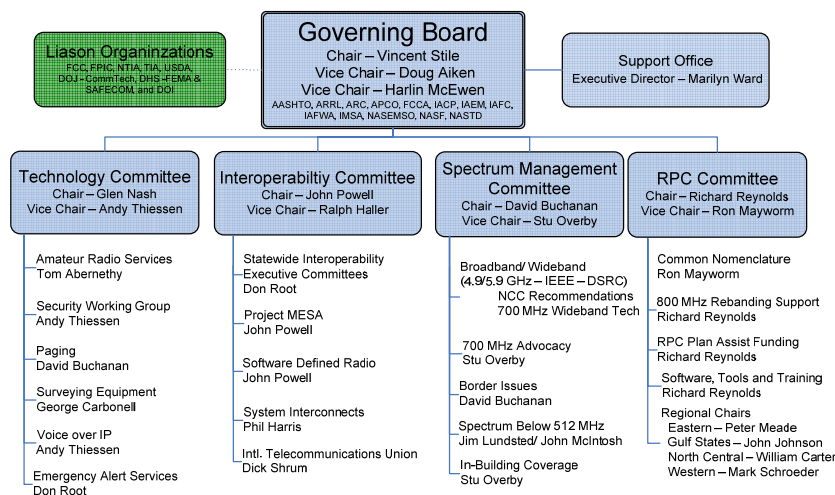
Interoperability, Regional Planning Committees, Spectrum Management, and Technology

Support Office (SO)

Provides administrative and technical support to the Governing Board and Committees

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NPSTC Organization



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What does NPSTC do for public safety?

- Develops and makes recommendations to appropriate governmental bodies on public safety communications issues and policies that promote greater interoperability and cooperation between local, state, tribal, and federal agencies.
- NPSTC provides a public stage for discussion of relevant public safety wireless telecommunications issues.
- Serves as a standing forum for the exchange of ideas and information, and works to identify and promote methods for funding development of public safety communications systems.
- Monitors new technology research, supports studies of public safety communications, and uses research to stay abreast of user needs.
- Communicates information on technology, research, and policy issues to the field through its website, www.NPSTC.org and through its quarterly newsletter, *spectrum*.

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U.S. Department of Homeland Security

Governance

- **Executive Committee (EC)**
 - The EC is the decision making body for the SAFECOM program
 - All EC members are included in the other committees
 - Meets quarterly
- **Emergency Response Council (ERC)**
 - The ERC is responsible for making recommendations to the EC
 - First meeting held on June 17, 2004 (Philadelphia)
 - Second meeting on January 27, 2005 (Orlando)
 - Third meeting on June 16, 2005 (San Antonio)
 - Fourth meeting scheduled for Dec 13-14, 2006 (San Diego)

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Public Safety Communications

What You Need to Know Now

Hurricane Katrina Lessons

Sheriff Kevin Beary of Orange County, Florida, speaking at the FCC Hurricane Katrina Independent Panel, on January 30, 2006, said

*“People plan for a **disaster**, and we have them frequently. However, Katrina was a **catastrophe**. She brought different challenges than the Florida hurricanes in 2004.”*

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Public Safety Communications

What You Need to Know Now

Disasters are fairly common

Disasters are usually handled by local authorities
The events of 9/11, although horrendous and with enormous impact, were a disaster

Catastrophes are rare and usually cover wide areas

Catastrophes are often beyond the capability of local authorities

Hurricane Katrina & the 2004 Asian Tsunami were catastrophes (*Hurricane Katrina affected parts of 4 states, an area equal to the size of Great Britain, about 90,000 square miles. The South Asian tsunami left nearly 170,000 people dead or missing in the Indonesian province of Aceh alone*)

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Public Safety Communications

What You Need to Know Now

Although Public Safety communications are delivered in a number of ways, most agencies rely upon their traditional government owned or leased land mobile radio systems. Such systems are usually built to plan for unusual stresses.

Public Safety also relies upon commercial cellular type services to augment and back-up their government systems.

In the Katrina situation, where traditional land mobile and commercial services were not available, satellite communications were also used, but unfortunately those services were not entirely reliable either.

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Public Safety Communications

What You Need to Know Now

Public Safety has traditionally planned for short term events/disasters – not long term widespread catastrophes

Six outcomes from Katrina reports stand out

1. **Tower/Infrastructure Failures**
2. **Power Failures**
Tower Sites, Dispatch Centers, Portable Radio Batteries
3. **Public Switched Telephone Network (PSTN) and Network Infrastructure Failures (landline & microwave)**
4. **Public Safety personnel issues**
5. **Need for deployable systems**
6. **Satellite Communications only partial solution**

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Public Safety Communications

What You Need to Know Now

Need for deployable communications systems

We need deployable systems that can be brought into an area where communications infrastructure is temporarily out of service or has been destroyed.

Commercial services have long had what are known as Cellular Systems on Wheels (COWS). In large scale catastrophes like Katrina we need more than COWS. We need similar deployable systems that are available to replace traditional public safety communications. Mobile systems like those deployed by Sprint-Nextel called SATCOLTs (*satellite-based cellular on light truck*) are needed.

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Public Safety Communications

What You Need to Know Now

Satellite Communications only partial solution

Satellite services (SatCom) were also utilized where traditional land mobile services were out of service but several problems were revealed.

Hand held satellite radio telephones were ineffective because:

- a. They failed when their batteries failed. (same as with traditional land mobile radios and cell phones)
- b. Personnel weren't familiar with how satellite radios worked and had not been trained in their operation
- c. Satellite radios not practical for local area communications and often limited to one-to-one communications

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Public Safety Communications

What You Need to Know Now

Many lessons learned from Katrina can easily apply to any short term disaster or long term catastrophic event - natural disasters such as a hurricane, tornado, flood, ice/snow storm, wild land fire, or earthquake, or a terrorist attack such as the events of 9/11.

The lessons tell us to be prepared for more than the short time outages that we have traditionally planned for

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Public Safety Communications

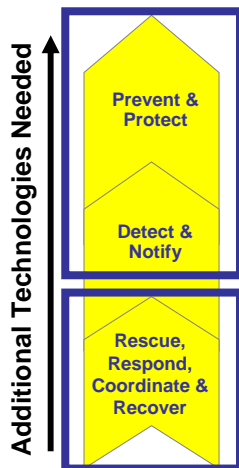
What You Need to Know Now

Wireless Data and Information Sharing

In recent years, public safety information sharing has rapidly expanded from fixed office computer terminals to wireless delivery of data for users in the field. Mobile Computer Terminals (MCTs) or Mobile Data Terminals (MDTs) mounted in vehicles will continue to be important and with the availability of reasonably priced hand held computer devices we will see an increasing demand for improved wireless data services.

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Expanding Mission of Public Safety



Data Centric Communications

As mission expands, high speed data networks will be more essential to support bandwidth intensive data, video and multimedia that will include VoIP services to augment and backup traditional land mobile mission critical voice

Voice Centric Communications:

Today, traditional land mobile voice and basic data service to support critical information transfer is a fundamental requirement for the public safety mission

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Public Safety Communications

What You Need to Know Now

Public Safety should be able to deploy **government owned ort managed** next generation high speed wireless data services that deliver not only secure text messages but documents, photographs, diagrams and streaming video.

Data such as these are being delivered to the public today by cellular type commercial services. Unfortunately public safety cannot rely on such commercial services because they often are not available when public safety needs them most.

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Public Safety Communications

What You Need to Know Now

Public Safety has been limited to narrowband slow speed 25 kHz radio channels in the VHF, UHF and 800 MHz bands (*9.6 kbps or 19.2 kbps*) only practical for text messages. Remember back to the days of the first dial-up modems at 14 kbps which eventually progressed to 28 kbps then 56 kbps.

FCC Rules require 25 kHz channels below 512 MHz to be narrowed to 12.5 kHz channels by 2013. (*That will mean even slower data on these channels.*)

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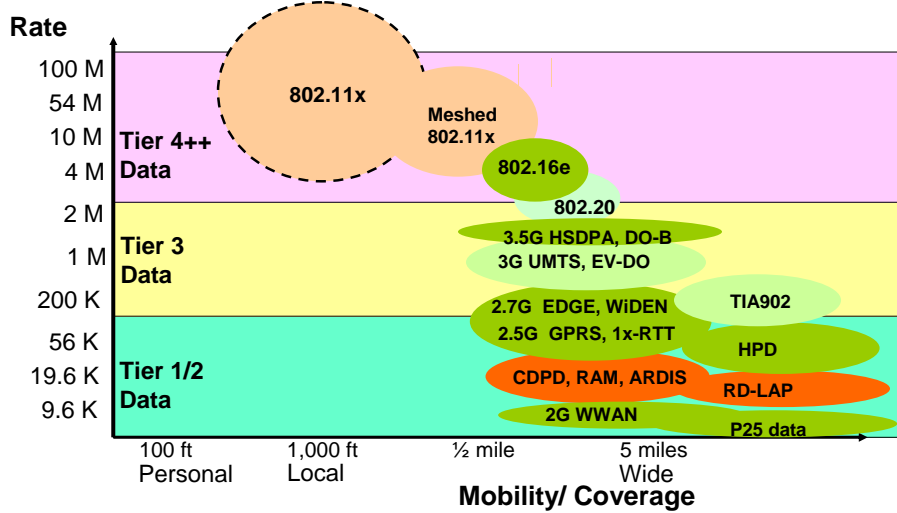
Public Safety Communications

Due to a lack of assigned public safety radio spectrum that is suitable for high speed data, public safety has historically been limited to narrowband slow speed radio channels only practical for voice and text messages.

That is changing with new spectrum being allocated by the FCC for public safety that is suitable for high speed data at 700 MHz and 4.9 GHz. The spectrum at 700 MHz is good for wide area and local area networks while the spectrum at 4.9 GHz, in general, is only practical for use in tactical situations, hot spots and local area networks.

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Mobile Wireless Data Technology Options



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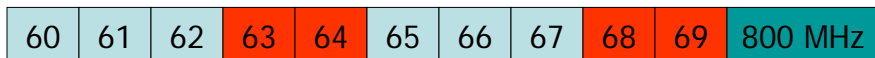
Public Safety Communications

What You Need to Know Now

In 1997, the FCC assigned 24 MHz of radio spectrum to public safety in the 700 MHz band.

On February 8, 2006, the President signed a law that requires TV Broadcasters to vacate those channels no later than February 17, 2009.

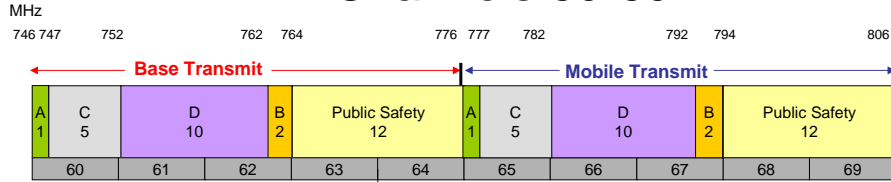
700 MHz (TV Channels 60-69)



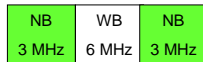
Public Safety-TV Channels 63,64,68,69

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Current Upper 700 MHz Band Plan TV Channels 60-69



NB - Narrowband
WB - Wideband

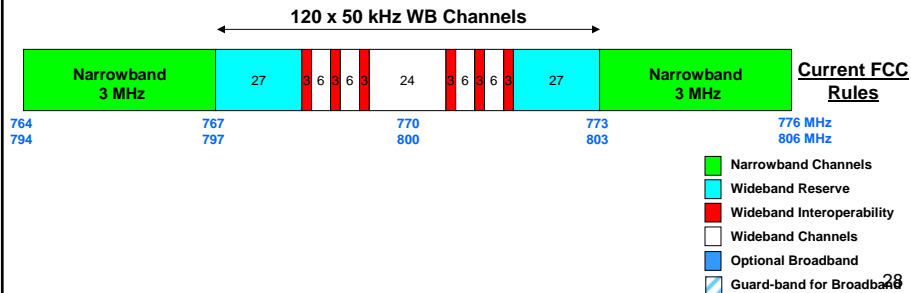


- Public Safety 24 MHz
- Access Spectrum 2 MHz – A Block
- Guard Bands 4 MHz – B Block
- CMRS 30 MHz – C and D Blocks

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Public Safety Communications What You Need to Know Now

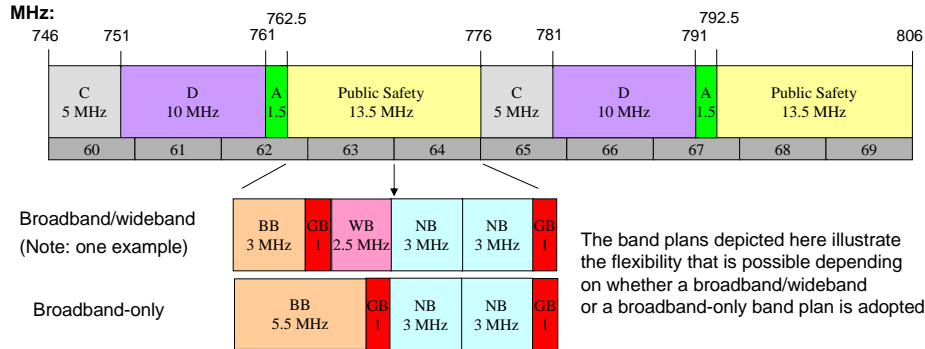
Current rules for the 700 MHz band allow for 50 kHz wideband data channels and allow 3 channels to be aggregated to one 150 kHz channel. They also provide for 18 wideband interoperability channels.



Access Spectrum Alternate Proposal

Broadband Optimization Plan

- **Step 1:** consolidate the narrowband spectrum at the top of the public safety allocation
- **Step 2:** contribute 3 of 4 MHz from the B Block to public safety for internal guard bands used to separate narrowband/wideband from public safety and/or commercial broadband
- **Step 3:** contribute the remaining 1 MHz from the B Block to the A Block and move the A Block to the lower end of the public safety block



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Public Safety Communications

What You Need to Know Now

One emerging option is the use of newly developing community systems utilizing **Unlicensed** 802.11 (Wi-Fi) Broadband Spectrum.

This presents an attractive solution for public safety to access wireless high speed internet service but public safety should view it as only a temporary solution where no other option exists.

Public Safety needs to be cautious because WiFi does not provide the needed public safety grade of service.

Issues of reliability & security

Off the shelf publicly available equipment makes it easy for someone to hack into and provide a Denial of Service (DOS)

Public availability can overload network and provide extremely slow or **no** service

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The Cyren Call Proposal For More PS Spectrum Petition for FCC Rulemaking April 27, 2006

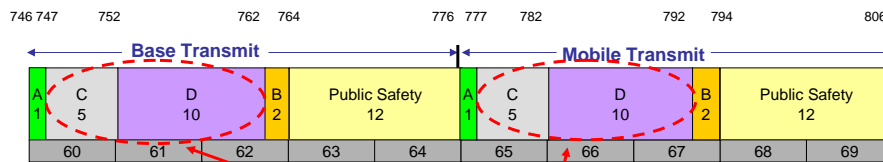
Establish a Public Safety Broadband Trust (PSBT)

The PSBT would

1. Be a Federal Government owned corporation with a Board of Directors controlled by public safety
2. Would hold the license for a 30 MHz block (C & D blocks) of cleared spectrum in the upper 700 MHz band
3. Would negotiate terms for long-term access to the spectrum with private entities that would agree to build and maintain a nationwide, next-generation network for public safety. In exchange, the private sector entities would gain the right to share the network and sell excess capacity for commercial purposes

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Current Band Plan - Upper 700 MHz TV Channels 60-69



- CMRS 30 MHz – C and D Blocks
- Access Spectrum 2 MHz – A Block
- Guard Bands 4 MHz – B Block
- Public Safety 24 MHz

Cyren Call Spectrum Focus

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The Cyren Call Proposal

PSBT would set appropriate rules and technical standards to ensure backward compatibility to existing public safety systems, maximum interoperability, reliability, redundancy, competition, innovation and choices for public safety customers using this spectrum. The network would include a satellite-based element to ensure continuous operations when ground-based equipment is knocked out.

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The Cyren Call Proposal

On May 11, 2006, the national organizations representing the leadership of public safety communications (APCO, IACP, IAFC, MCC, MCSA, and NSA) sent a joint letter to Senators Ted Stevens (R-Alaska) and Daniel Inouye (D-Hawaii) expressing the view that, although the organizations have not endorsed the Cyren Call proposal, the concept of reallocating the 30 MHz of spectrum in the upper 700 MHz band in a manner that would promote interoperable, public safety broadband communications is worthy of public discussion.

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The Cyren Call Proposal

The Cyren Call concept could give significant benefits to public safety

1. **Broadband data services (such as text messaging, photos, diagrams, and video) not currently available in existing public safety land mobile systems.**
2. **A hardened public safety network with infrastructure built to withstand local natural hazards (tornadoes, hurricanes, earthquakes, floods, etc) that would include hardened towers and back up power with fuel supplies to withstand long term outages of public power sources.**
3. **Nationwide roaming and interoperability for local, state, and federal public safety agencies (Police, Fire and EMS) and other emergency services such as transportation, health care, and utilities.**
4. **Access to the Public Switched Telephone Network (PSTN) similar to current commercial cellular services.**
5. **Push to talk one to one and one to many radio capability that would provide a back-up to (not replace) traditional public safety land mobile mission critical voice systems.**
6. **Access to satellite services to provide reliable nationwide communications where terrestrial services either do not exist or are temporarily out of service.**
7. **A nationwide network that**
 - a. **Would not be paid for by public safety or the taxpayers. Commercial operators using excess capacity would fund that cost.**
 - b. **Would be licensed and controlled by public safety.**
 - c. **Would continue to be refreshed with the latest technical improvements with funds coming from the commercial participants.**

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M2Z Networks

Broadband Proposal for 2 GHz Band

Would build a national broadband public network that would provide limited free broadband access to public safety

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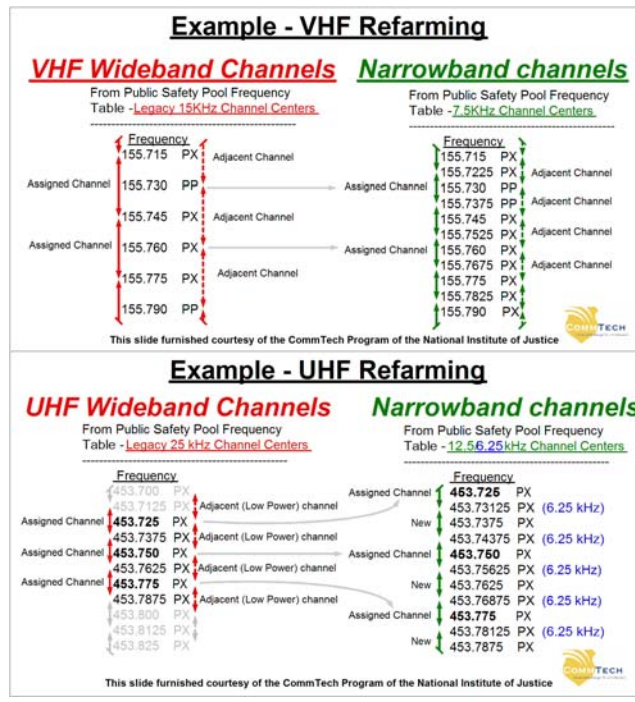
Narrowbanding

VHF 150-170 MHz UHF 421-512 MHz

Dec. 23, 2004 - FCC released order

1. Applications for new operations and for modifications to expand geographic coverage using 25 kHz channels accepted until **January 1, 2011**
2. Deadline for use of 25 KHz equipment in the Public Safety market is **January 1, 2013**

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PAGING ISSUES

Slides(s) to be prepared by Glen Nash

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Up To Date 800 Rebanding Information

APCO 800 MHz Web site

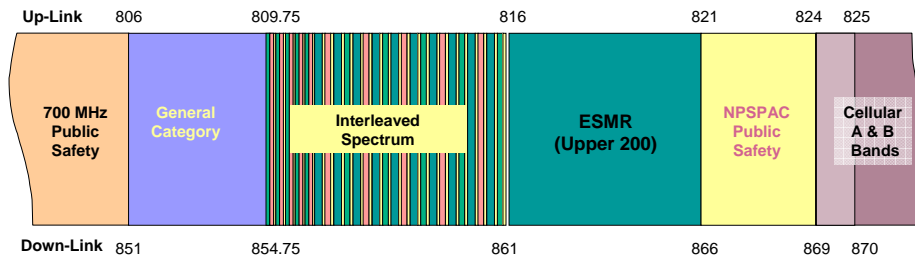
<http://www.800mhz.org>

800 MHz Transition Administrator

<http://www.800ta.org>

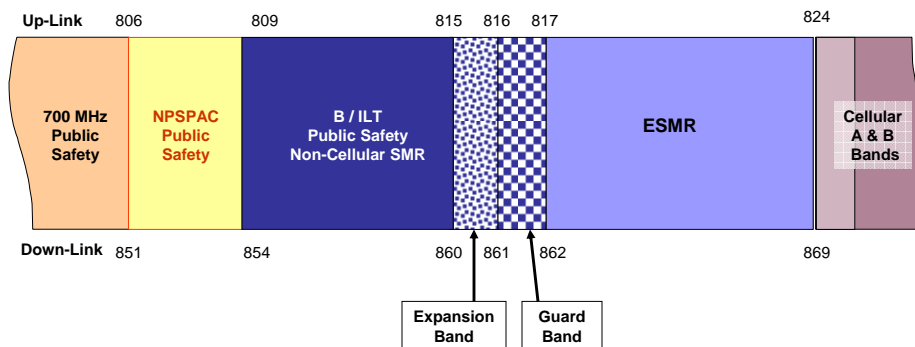
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800 MHz Current Band Configuration



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800 MHz New Band Configuration



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Public Safety Communications

What You Need to Know Now

In closing we would like to stress the need to stay focused mainly in improving mission critical Voice Operability with a goal to improving Voice Interoperability.

However, you must also be aware of the newly emerging opportunities to improve data services that are rapidly becoming mission critical.

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