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NATIONAL INTEROPERABILITY SUMMIT

Improving Interagency Communications Nationwide

Austin, Texas
May 24, 2006

Key Interoperability Issues in the United States

Interoperability Issues Facing Responder Agencies Nationwide

PRIORITY # 1

Reliable Agency Specific Voice Communications

Public Safety mission critical every day voice communications

PRIORITY # 2

Reliable InterAgency Voice Communications

This is what we commonly refer to as "Interoperability"

PRIORITY # 3

Reliable Data Communications

There is an increasing need for Public Safety to have access to secure text messaging, documents, photographs, diagrams, streaming video

Interoperability Issues Facing Responder Agencies Nationwide

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

1. They can reach the intended target 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

Interoperability Issues Facing Responder Agencies Nationwide

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

Interoperability Issues Facing Responder Agencies Nationwide

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."*

Interoperability Issues Facing Responder Agencies Nationwide

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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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, and to a smaller degree on satellite communications, for supplemental or back up communications services, but unfortunately those services are not always reliable when public safety needs them the most.

Interoperability Issues Facing Responder Agencies Nationwide

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**

Interoperability Issues Facing Responder Agencies Nationwide

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.

Interoperability Issues Facing Responder Agencies Nationwide

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 limited to one to one communications

Interoperability Issues Facing Responder Agencies Nationwide

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

Interoperability Issues Facing Responder Agencies Nationwide

National Public Safety Network issues

- M/A-COM NINDR Proposal
- Cyren Call Proposal
- Senate Committee on Homeland Security

Wireless data and information sharing

Interoperability Issues Facing Responder Agencies Nationwide

M/A-COM Proposal – National Interoperability Network for Disaster Relief (NINDR)

Proposes an Internet Protocol (IP) national network that would cost only slightly more than $1 billion and could be implemented within months. *(in my opinion both bad assumptions)*

It would connect the local and federal mutual aid channels to an IP network.

Interoperability Issues Facing Responder Agencies Nationwide

In my view, the M/A-COM NINDR Proposal is impractical and shows a lack of understanding of the myriad of public safety systems that are licensed and operated by thousands of public safety agencies throughout the nation.

Simply tying together the mutual aid channels would do very little to solve interoperability problems.

Interoperability Issues Facing Responder Agencies Nationwide

The Cyren Call Proposal (4/27/06)

(Morgan O'Brien, a co-founder of Nextel)

Establish a Public Safety Broadband Trust (PSBT) that would hold the license for a 30 MHz block of cleared spectrum in the upper 700 MHz band

PSBT 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

Interoperability Issues
Facing Responder Agencies Nationwide

The Cyren Call Proposal (Cont'd)

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.

Interoperability Issues Facing Responder Agencies Nationwide

The Cyren Call proposal (Cont'd)

In my view this is a bold and exciting proposal that could be very good for public safety.

However, there are numerous obstacles –

Law now requires spectrum to be auctioned

Auction proceeds would provide

- $10 Billion+ to reduce federal deficit
- $1 Billion to Public Safety
- Funds to subsidize purchase of television set-top converter boxes to convert digital signals to analog
- Funds for E911 systems

This law is a huge obstacle that must first be overcome if the Cyren Call proposal can be successful

Interoperability Issues Facing Responder Agencies Nationwide

Senate Committee on Homeland Security

Report “HURRICANE KATRINA: A NATION STILL UNPREPARED” (4/26/06)

Recommendation 26: DHS should develop a national strategy, including timeframes, for implementing a survivable, resilient, national interoperable communications network. DHS should establish.....

This oversimplifies the problem and the need to improve interoperability. All public safety personnel do not need to be able to talk to all other public safety personnel. A nationwide network *(other than perhaps the Cyren Call proposal)* is not practical nor affordable.

Interoperability Issues
Facing Responder Agencies Nationwide

Wireless Data and Information Sharing

In recent years, law enforcement information sharing has rapidly expanded from fixed office computer terminals to wireless delivery of data for users in the field. Mobile Computer Terminals (MCTs) 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.

Interoperability Issues Facing Responder Agencies Nationwide

Law Enforcement and Public Safety should be able to deploy government owned next generation 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.

Interoperability Issues Facing Responder Agencies Nationwide

Due to lack of radio spectrum assigned to public safety we have 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.)*

Interoperability Issues Facing Responder Agencies Nationwide

Public Safety has been limited to using cellular type commercial data services
(e.g., Verizon, Sprint/Nextel, Cingular).

The new 4.9 GHz public safety band *(not intended for or practical for wide area networks)* gives us one opportunity for access to high speed data.

Interoperability Issues Facing Responder Agencies Nationwide

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

Beware. WiFi does not provide the needed public safety grade of service.

Issues of reliability & security

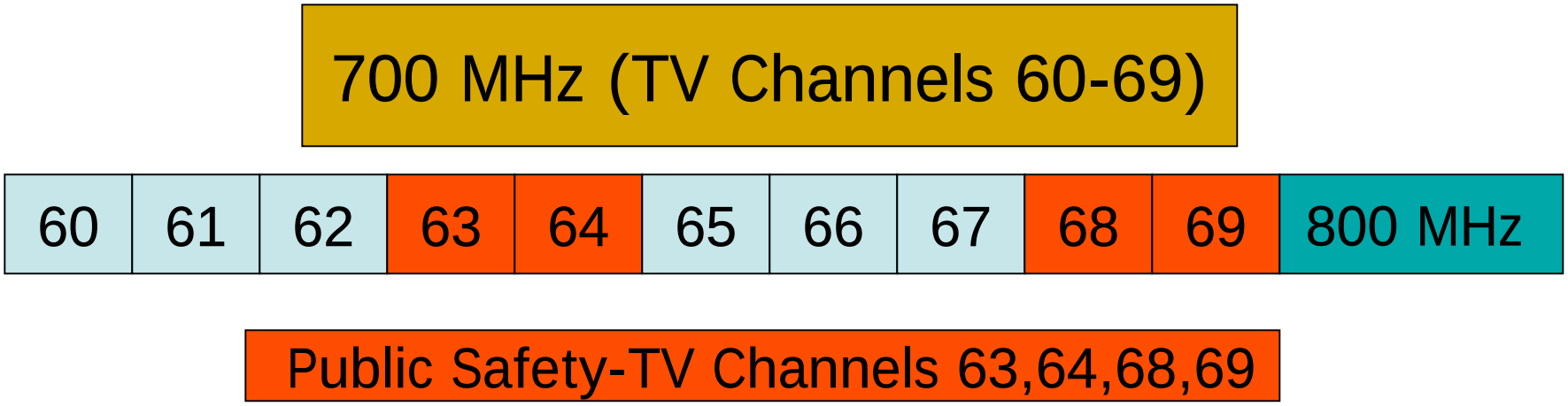
Off the shelf publicly available equipment makes it easy for someone to hack into and provide a Denial of Service (DOS)

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

Interoperability Issues Facing Responder Agencies Nationwide

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.

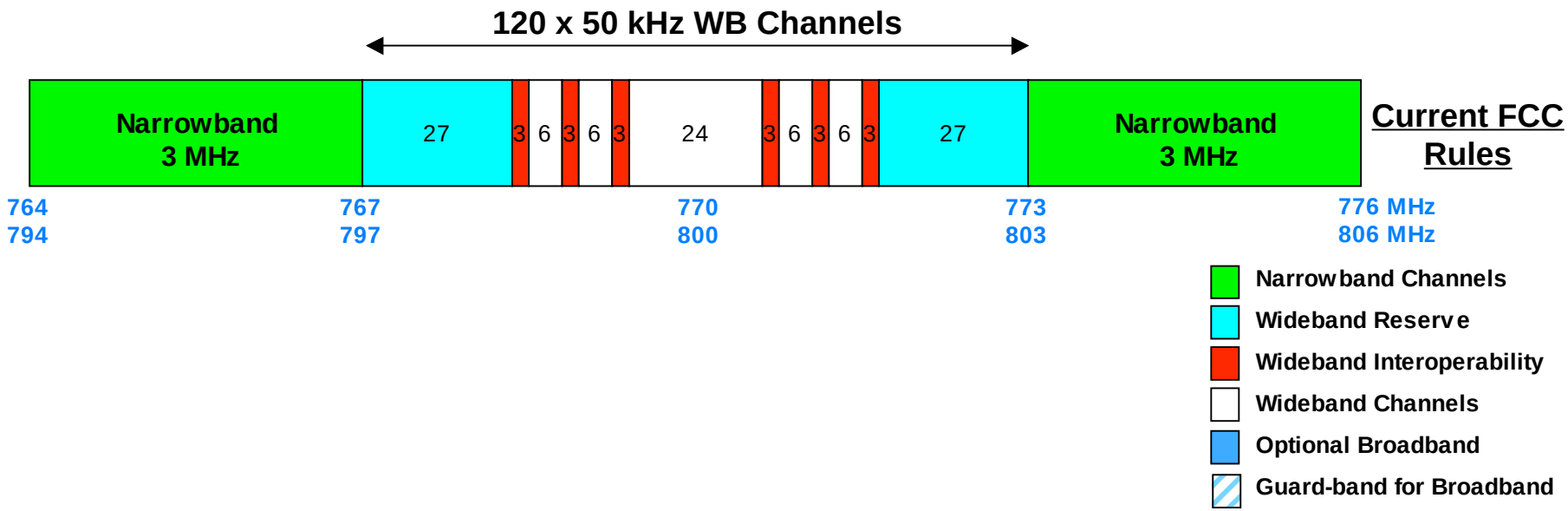


Interoperability Issues Facing Responder Agencies Nationwide

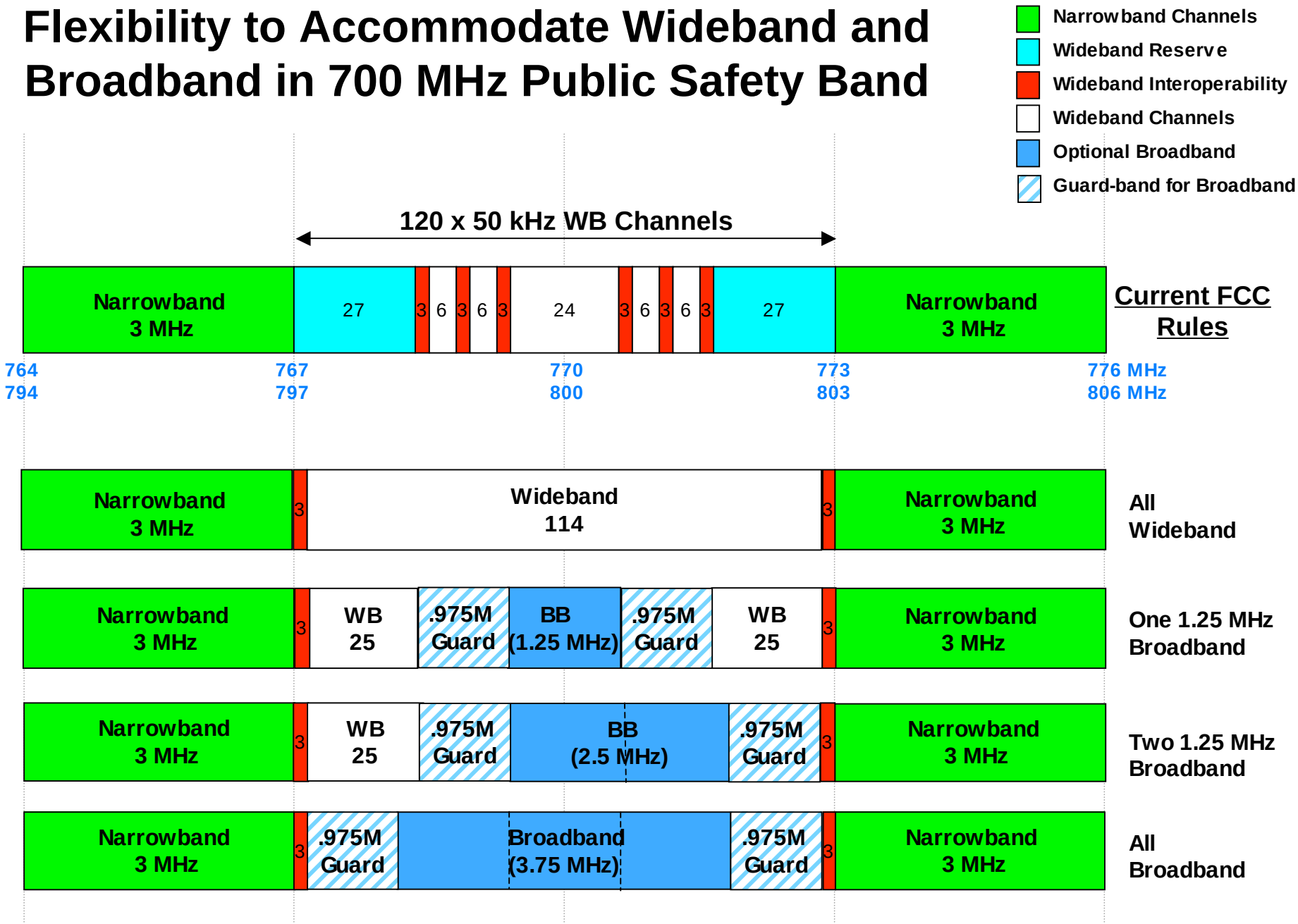
On February 6, 2006, the National Public Safety Telecommunications Council (NPSTC) sent a letter to the FCC proposing they revisit the data portion of the 700 MHz public safety spectrum. As a result of the NPSTC petition, on March 21, 2006, the FCC issued a Notice of Proposed Rulemaking (NPRM) inviting comments on the proposal to allow more aggregation of channels to authorize 1.25 MHz broadband channels that could be aggregated to 3.75 MHz. *(Using broadband technology such as EVDO you need at least one 1.25 MHz channel).*

Initial comments to the FCC are due June 6, 2006.

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.



Flexibility to Accommodate Wideband and Broadband in 700 MHz Public Safety Band



Interoperability Issues Facing Responder Agencies Nationwide

Wideband System Example

In a system design for a Minnesota regional system (Hennepin and Washington Counties and the Metropolitan Emergency Services Board of St. Paul) it is proposed to use the TIA-902 standard (SAM).

TIA-902 systems operating on full 50 kHz bandwidth will not be available until 2008 and the initial phase will be implemented using a reduced bandwidth emission producing a channel data rate of up to 96 kbps.

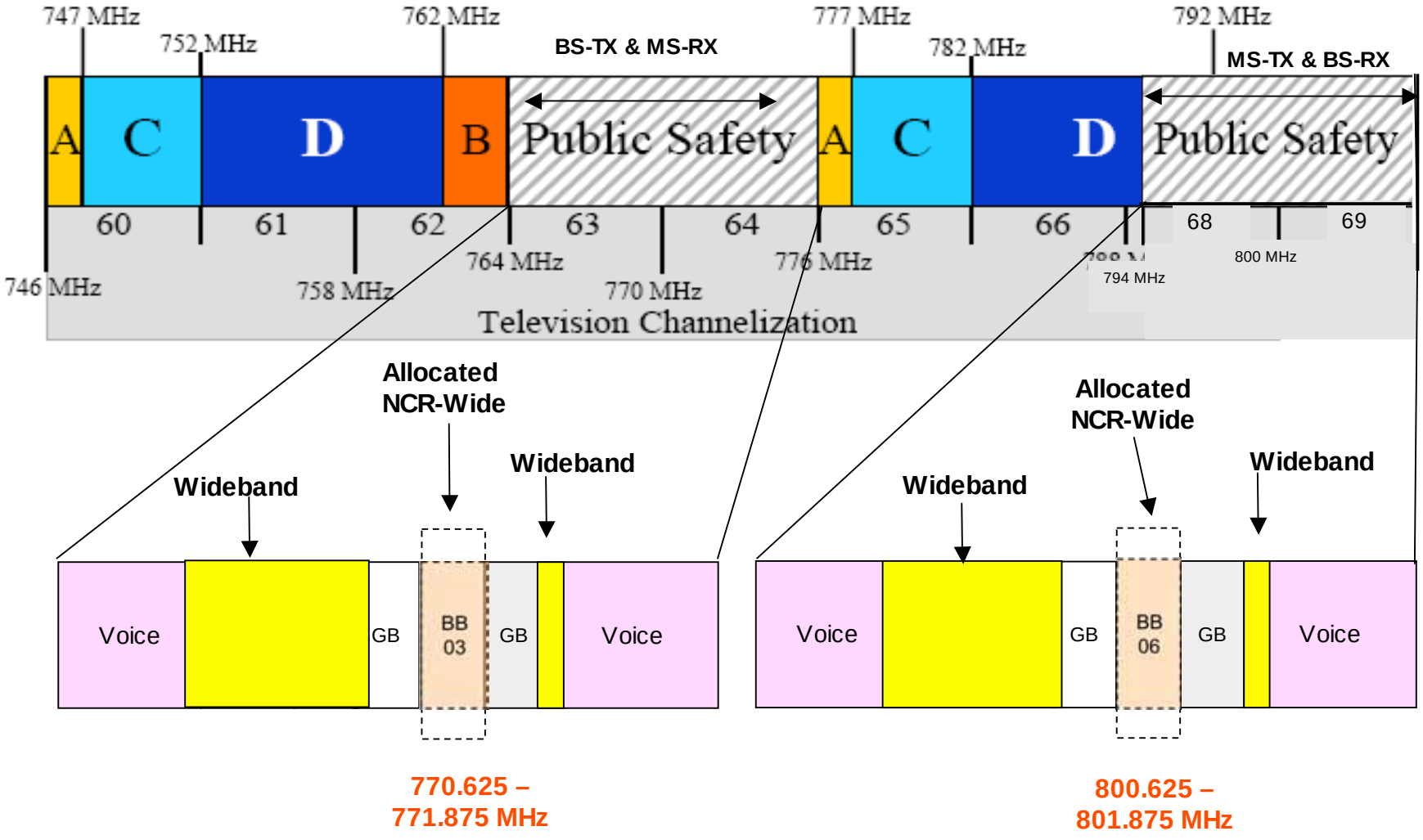
In 2008 the system will be upgraded to increase bandwidth to fully occupy a 50 kHz channel producing a channel data rate of up to 230 kbps.

Interoperability Issues Facing Responder Agencies Nationwide

Broadband System Example

A recent pilot system (operated under a temporary license) implemented by the DC Government Office of Chief Technology Officer (OCTO) showed the benefits of deploying a regional broadband data system. This system used during the Inauguration and other major events in the District has resulted in many lessons learned that can be utilized in developing a National Capital Region “Regional Wireless Broadband Network” (RWBN).

National Capital Regional Wireless Broadband Network (Proposed Channel Plan)



Interoperability Issues Facing Responder Agencies Nationwide

In closing I 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.