

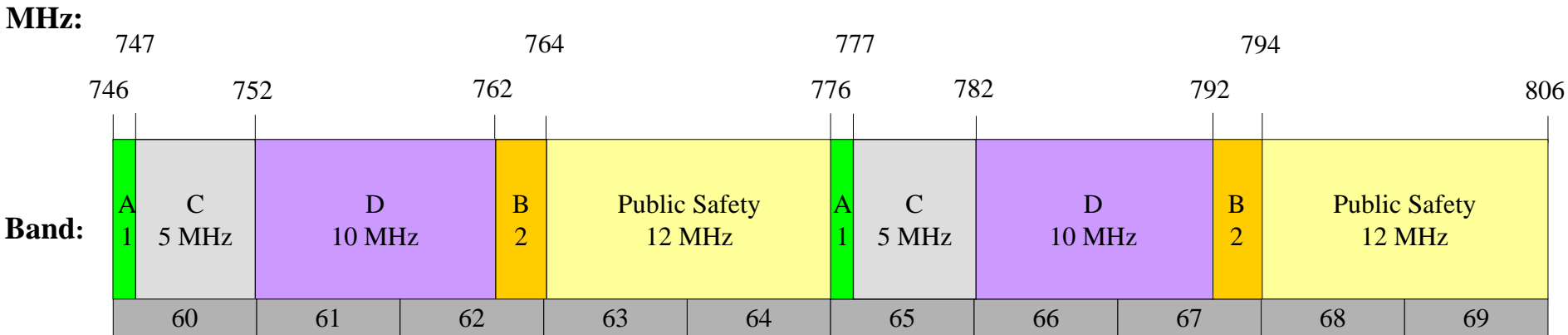
# **The Upper 700 MHz Broadband Optimization Plan**

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**June 2006**

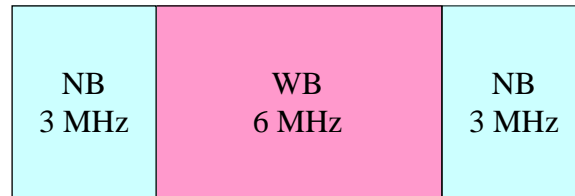
# Introduction

- Current upper 700 MHz band



NB – Narrowband

WB – Wideband

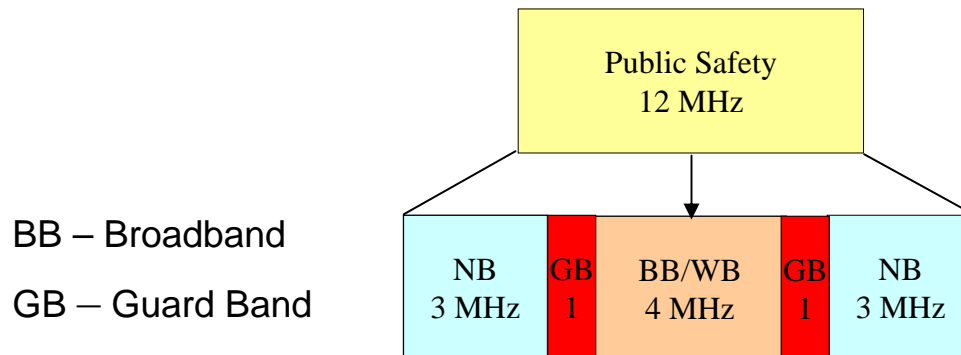


# NPRM proposals

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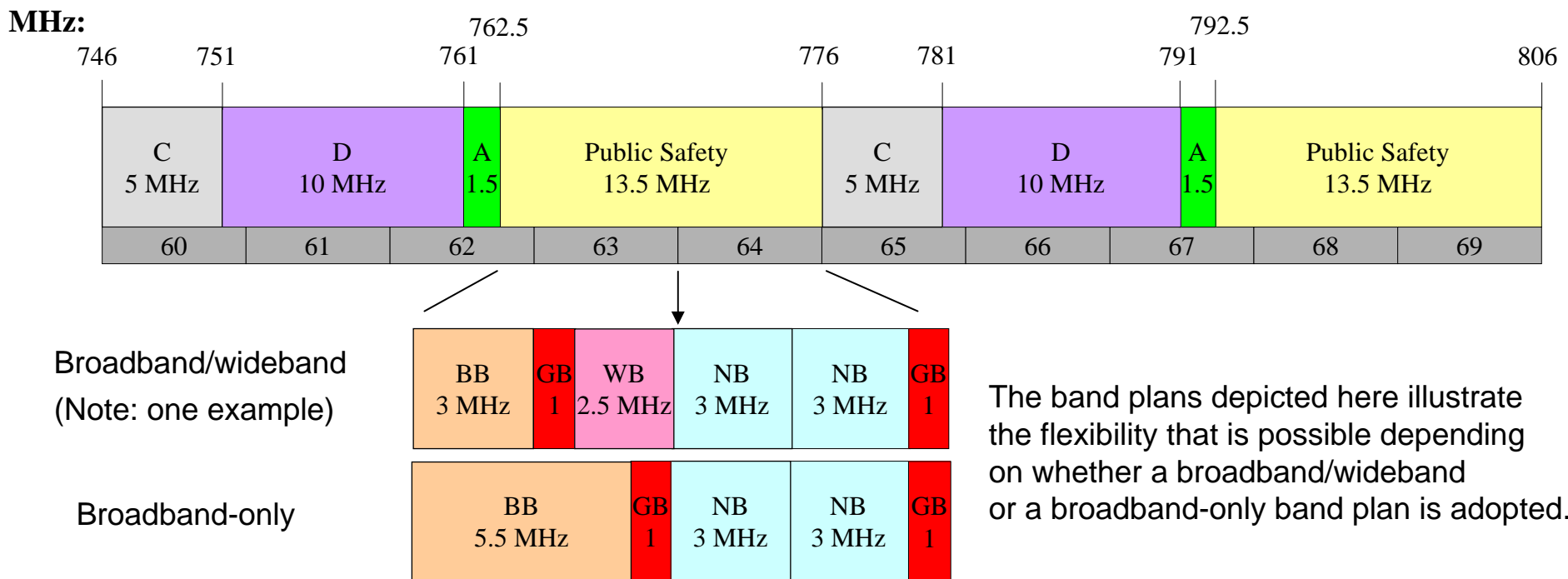
- At NPSTC's request, the FCC has asked for recommendations on how to best accommodate broadband within the public safety allocation while
  - Maintaining 12 MHz of spectrum (6 MHz paired) devoted to narrowband voice
  - Ensuring there is ~1 MHz of "guard band" to protect narrowband from broadband
- The NPRM proposals each require internal guard bands and as such:
  - Nullify the possibility for a contiguous 5 MHz block of spectrum and unnecessarily restrict the amount of public safety wideband/broadband capacity
  - Require eight 1 MHz guard bands and waste the remaining B Block spectrum, resulting in 10 MHz of "wasted" spectrum
  - Make it impossible to have adjacent public safety and commercial broadband for public safety/commercial "mixed-use" partnerships in the future

## NPRM proposals



# The Upper 700 MHz Broadband Optimization Plan

- Step 1: consolidate the narrowband spectrum at the top end 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



# Benefits of the plan

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- Maintains and protects public safety's narrowband allocation
  - Permits the public safety community to control its guard bands rather than have the guard bands utilized by commercial licensees
- Adds 3 MHz to public safety's overall allocation (from 24 MHz to 27 MHz)
  - Maximizes flexibility to take advantage of broadband technologies
    - Increases broadband capacity by one 1.25 MHz broadband channel
    - Permits the use of technologies that require 5 MHz of contiguous spectrum
- Increases the efficiency of the 700 MHz spectrum allocation
  - Reduces the amount of “wasted” spectrum from 10 MHz to 3 MHz
  - Maximizes the utilization of the A and B Blocks
- Provides opportunities for public safety/commercial partnerships to deploy “mixed-use” or “shared” networks with public safety priority access
  - Public safety broadband would be adjacent to commercial broadband
- Accomplishes these benefits while preserving the soon-to-be auctioned commercial C&D Blocks in their entirety

# Potential issues with the plan

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- There are five primary potential issues that have been identified (see following slide)
- It is important to analyze each potential issue carefully to ensure that adoption of the Upper 700 MHz Broadband Optimization Plan:
  - Does not require public safety agencies to incur unnecessary costs
  - Is implemented in the most simple and non-disruptive manner possible
- It is vital to resolve all potential issues and as such we are working to both quantify their magnitude and formulate possible solutions

# Potential issues with the plan (cont'd)

Issue	Details	Comments
Equipment sold	<ul style="list-style-type: none"> <li>• ~600,000 “dual-band” radios have been sold (number increasing daily) and a few 700 MHz systems have been deployed</li> </ul>	<ul style="list-style-type: none"> <li>• Financial, technical and operational resources required to re-program dual-band radios (no hardware changes necessary)</li> <li>• Unclear how many dual-band radios will be used at 700 MHz (to consider: life cycle of radios/pace of 700 MHz infrastructure deployments)</li> </ul>
International agreements	<ul style="list-style-type: none"> <li>• Canada agreed to vacate channels 63/68 (but not channels 64/69) along the border prior to full DTV transition</li> </ul>	<ul style="list-style-type: none"> <li>• Few affected areas</li> <li>• Negotiations underway for full band clearance in early 2009</li> <li>• Interim “fixes” are likely feasible</li> </ul>
RPC/State planning	<ul style="list-style-type: none"> <li>• Any completed State or regional plan would need to be modified</li> </ul>	<ul style="list-style-type: none"> <li>• Few plans have been approved</li> <li>• Required revisions would be minor</li> <li>• Several RPCs say costs of adjusting plans are small</li> </ul>
System designs and waivers	<ul style="list-style-type: none"> <li>• System designs and waiver requests are underway</li> </ul>	<ul style="list-style-type: none"> <li>• Suggested band plan modifications should not have much effect on system designs or waivers</li> </ul>
Timing/delay	<ul style="list-style-type: none"> <li>• System deployments may be delayed pending FCC action</li> </ul>	<ul style="list-style-type: none"> <li>• Reach consensus outside the regulatory process</li> <li>• FCC can expedite action</li> </ul>

# Conclusions

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- The Upper 700 MHz Broadband Optimization Plan
  - Enhances public safety's control over potential interference to narrowband systems
  - Increases public safety's overall spectrum allocation and maximizes future flexibility
  - Improves the overall spectral efficiency for BOTH the public safety and adjacent spectrum and thus enhances the utility of the Upper 700 MHz band
  - Enables the public safety community to leverage private sector investment through the use of modified commercial-off-the-shelf technologies and public safety-commercial "mixed-use" partnerships
  
- The time to act is now
  - The costs associated with implementing the suggested modifications are small compared to the time and cost of implementing them in the future
  - Modifications made today enable significant future benefits and options that would otherwise be foreclosed

# Appendix: comparison of alternatives

➤ Key below: Green (superior when compared to other plan); Red (inferior)

Comparison of Potential Upper 700 MHz Band Plans											
Category	Planning for the Future			Spectral Efficiency				Mixed-Use Potential	Control of Guard Bands	Potential Costs	
Public Safety Options	Public Safety Spectrum Capacity # of BB Channels		Future Flexibility	Amount of "Wasted Spectrum"				Optimal for PS/Comm. Partnership? Commercial Neighbor in PS Allocation?	Public Safety Control? Public Safety or Commercial?	Need to Move NB? Yes or No?	Amount of Optimal Commercial BB Spectrum Upper 700 MHz Band
	1.25 MHz	5 MHz	5 MHz or Not?	Public Safety	Commercial	Total	Lost Value <sup>(1)</sup>				
NPRM Proposals	2 or 3	0	No	4 MHz	6 MHz	10 MHz	\$30.0 - \$54.4 billion	No	Commercial	No	30 MHz
Upper 700 MHz Broadband Optimization Plan	4	1	Yes	0 MHz	3 MHz (B to PS)	3 MHz	\$9.0 - \$16.2 billion	Yes	Public Safety	Yes	33 MHz

(1) Assumes spectrum value of \$1.00/MHz-pop; economic value = 10-18X the spectrum value

**Value when Compared to Other Plan:**  
Green Superior  
Red Inferior

**Key:**  
 PS - Public Safety  
 MU - "Mixed-Use"  
 Comm. - Commercial  
 BB - Broadband  
 NB - Narrowband