



# Maintaining Public Safety Communications Reliability and Interoperability in the 700 MHz Band

## NPSTC Recommends Against Mixing Narrowband and Broadband Technologies in the Same Spectrum Segment

### Introduction and Executive Summary

NPSTC understands that some jurisdictions have expressed potential interest in converting the 700 MHz narrowband spectrum to broadband use. Doing so would result in a mix of narrowband and broadband operations across different jurisdictions in the same block of 700 MHz band spectrum. Based on information currently available, NPSTC recommends against mixing broadband and narrowband operations in the same spectrum, as doing so can negatively impact both public safety communications reliability and interoperability.

Based on recommendations from the public safety community and direction from Congress, the Federal Communications Commission (FCC) adopted rules for the 700 MHz spectrum that provide the opportunity for both reliable broadband and narrowband operations with nationwide interoperability in each set of operations. As shown in Figure 1 below, narrowband public safety operations are conducted in a designated 6 +6 MHz block of paired spectrum while broadband operations are being planned in a designated 10 +10 MHz paired block of spectrum licensed to the First Responder Network Authority (FirstNet).<sup>1</sup> A 1 +1 MHz “guardband” also licensed to FirstNet separates narrowband and broadband spectrum. Although Section 6102 of Public Law 112-96 provides that the FCC may allow flexible use of the narrowband spectrum, it does not require the FCC to do so. Furthermore, for interoperability, the FCC designated Project 25 (P25) as the technology required for narrowband interoperability channels and Long Term Evolution (LTE) as the technology for broadband operations.

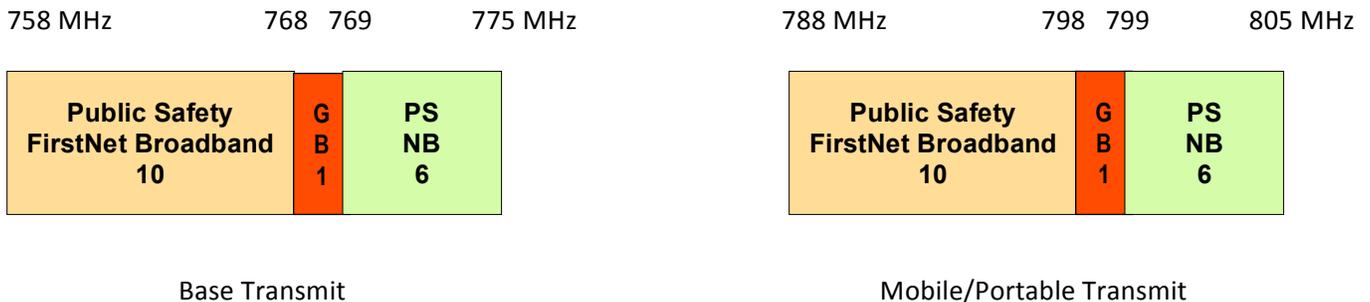


Figure 1: 700 MHz Public Safety Bandplan (Paired Spectrum)

<sup>1</sup> A few early narrowband operations deployed in what is now broadband spectrum licensed to FirstNet are being relocated into the designated narrowband spectrum. See Report and Order and Notice of Proposed Rulemaking, PS Docket Nos. 16-269, 12-94 and 06-229 and WT Docket No. 06-150, released August 26, 2016.

## **Increasing Reliability through Interference Prevention**

The wisdom of this spectrum plan is that it helps prevent interference between narrowband and broadband operations, thereby increasing communications reliability. In contrast, mixing narrowband and broadband operations in the same spectrum undercuts that benefit for public safety by increasing the risk of interference. Although the underlying engineering analysis is complex, the bottom line is that attempting to operate broadband and narrowband operations in the same area impacts the coverage reliability of both narrowband and broadband systems.

Given a broadband LTE signal deployed in the narrowband spectrum would likely be 5 MHz wide, it could affect up to 400 narrowband 12.5 kHz channels on a co-channel basis, spanning general use, state, and interoperability channels. When operated in adjacent areas, e.g., one jurisdiction has broadband and an adjacent jurisdiction has narrowband, operations are impacted along the border of the jurisdictions. For example, technical analysis shows that in a suburban environment, such a situation would create a buffer zone approximately 5 miles wide where interference is likely, communications reliability would be reduced, and neither jurisdiction could enjoy full use of the spectrum. Furthermore, narrowband operations tend to be designed with relatively high sites while broadband operations are expected to deploy more low sites. The public safety community already has spent over 8 years and hundreds of work hours conducting “800 MHz rebanding” to separate high site and low site operations into separate blocks of spectrum. It would be counterintuitive indeed to initiate steps that mix high site narrowband and low site broadband operations in the same 700 MHz spectrum block.

## **Interoperability**

Another benefit of the current 700 MHz plan is that it establishes the foundation for nationwide interoperability in both the narrowband and broadband spectrum by dedicating spectrum for each type of operation. A number of jurisdictions have already deployed systems in the narrowband 700 MHz spectrum, which also serves to supplement spectrum at 800 MHz, given multi-band equipment now available. FirstNet has made significant progress toward deployment of the Nationwide Public Safety Broadband Network (NPSBN). Deploying broadband operations piecemeal in the narrowband spectrum would destroy this foundation of interoperability, for both narrowband and broadband operations. As noted in previous Association of Public Safety Communications Officials – International (APCO) comments in response to a Commission question about allowing broadband in the narrowband spectrum:

...existing interoperability plans across the nation depend upon the 700 MHz band for common narrowband channels using standardized, interoperable radio equipment. Inserting broadband in narrowband spectrum would break down the interoperability benefits that have long been a fundamental aspect of the 700 MHz public safety band.<sup>2</sup>

Significant additional 700 MHz narrowband deployment has occurred since that statement, making it all the more important today. Allowing some agencies in some jurisdictions to use the narrowband 700 MHz spectrum for broadband will undermine the interoperability progress that has been achieved to date.

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<sup>2</sup> Comments of APCO International, PS Docket No. 06-229, December 3, 2010.

## **Conclusion**

The public safety community has spent many years of work with the FCC to establish a 700 MHz plan that provides the foundation for reliable and interoperable narrowband and broadband operations. Many jurisdictions already have deployed 700 MHz narrowband operations, some funded by significant federal grants. FirstNet is on the cusp of finalizing plans for the 700 MHz NPSBN. Implementing the piecemeal deployment of broadband operations in the designated narrowband spectrum would undermine these initiatives and would negatively impact communications reliability and interoperability. Accordingly, NPSTC recommends against mixing narrowband and broadband operations in the same spectrum blocks at this time.