

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Improving Public Safety Communications in the)
800 MHz Band)
) **WT Docket No. 02-55**
Consolidating the 900 MHz Industrial/Land)
Transportation and Business Pool Channels)
)

**Comments of
Commonwealth of Virginia, Department of Information Technology**

The Commonwealth of Virginia hereby submits the following comments in response to the Commissions Notice of Proposed Rule Making (NPRM), FCC 02-81, released March 15, 2002, in the above captioned proceeding.

The Commonwealth of Virginia (COV) is actively involved in the 800 MHz regional planning process. The COV is part of two National Public Safety Planning Advisory Committees (NPSPAC), Regions 42, and 20. These Regions assist in the planning of sophisticated 800 MHz radio systems from the Metropolitan DC areas to all of Virginias' surrounding boarders. Users of these 800 MHz radio systems in the Commonwealth include higher education personnel, to large public school operations, to Fire, EMS and Police agencies. These individuals, associated with these entities, rely almost exclusively on their public safety communications--- from child safety and motorist assistance incidents to emergency situation responses in which every second can be crucial. Unlike consumer based Specialized Mobile Radio (SMR) and cellular operations, which are mostly convenience and casual services, Public Safety Communications is an absolute necessity. Public Safety Communications systems serve and work to the overall best interest of the citizenry. On September 11th, many of our 800 MHz systems within our Virginia communities were put to the test with high traffic volumes and priority access. Our citizens cannot tolerate interference from consumer oriented commercial services or cellular operations during any incident—whether it is nine-eleven, an individual choking on food, or a stranded motorist. It is in the best interest of the general public that our 800 MHz Public Safety Communications not fail or become comprised. Furthermore, the Commonwealth affirms the Commissions assertion that Commercial Mobile Radio Service (CMRS) interference to public safety is a serious problem and that a solution must be found.¹

¹ Section III, 16th paragraph, NPRM 02-81, WT-Docket No. 02-55

The Following comments will focus on:

1. Opening remarks and comments
2. Aspects the 800 MHz interference problem.
3. Implications of re-banding of the 800 MHz Spectrum. .
4. Funding considerations
5. Conceptual considerations for improving 800 MHz Public Safety Communications
6. Concluding comments

I. 800 MHz Public Safety Communications—Opening Remarks And Comments

In the matter of improving Public Safety Communications in the 800 MHz band, the Commonwealth applauds the Commission for its undertaking of such a crucial issue. The Commonwealth agrees with the Commission that it is important, “to explore all available options and alternatives for improving the spectrum environment for public safety operations in the 800 MHz Band.”^{2,3}

II. 800 MHz Interference:

A. Background

As mentioned and depicted in the NPRM, 800 MHz Public Safety Spectrum is primarily authorized in two blocks of spectrum:

- Interleaved between the Spectrum block of 809.7500/854.7500 MHz to 816.000/861.000 MHz
- NPSPAC Spectrum block. (821.000/866.000 MHz to 824.000/869.000 MHz

800 MHz Public Safety users have been subjected to interference from both of these blocks

² Section I, 3rd paragraph, NPRM 02-81, WT-Docket No. 02-55

³ In agreeing with the intent of the statement we are not necessarily agreeing with the some of the proposed methodologies, or ideas, within the NPRM that may be counter productive to public safety and the public interest.

B. Problem

In general some of the causes are:

Contrasting System Designs---Public Safety and Commercial wireless systems have contrasting design and implementation methodologies. These differences tend to impact and impede 800 MHz Public Safety systems—Digital Commercial and Cellular systems use a cellular architecture and a co-location, or cluster of towers, within a small operating area. Public Safety use less towers and cover a larger area of operation. These differences of system design usually result in operational degradation for Public Safety users operating near these commercial towers or facilities. Note--all users are operating within licensed guidelines.⁴

Receiver overload— Interleaved Channel assignment—This interference is caused to Public Safety receiving equipment due to receiver overload. This typically happens when a Public Safety receiver is operating relatively close to a Commercial or cellular tower, which is transmitting on an adjacent channel. These interfering components can be as a result of antenna tower placement, or tower characteristics—orientation, downtilt, direction and height of antenna. Some of these interference components can be negotiated out by the reorientation of the antennae, or modification to the overall antenna/tower characteristics.

Intermodulation—Intermodulation components can be introduced into a Public Safety receiver by an external mixing of signals,⁵ which typically originate from the SMR and/or cellular towers. Commercial and cellular tower typically are co-located on the same antenna structure. Similarly, cellular and commercial SMR towers may be within a very short distance ($\frac{1}{4}$ mile or less) from one site to another. Because of co-location or the close proximity of these towers, interfering signals may be generated. These signals may degrade nearby Public Safety communication efforts.

⁴ See page 15 “PROMOTING PUBLIC SAFETY COMMUNICATIONS” (The White Paper) Nextel Communications, Inc November 21, 2001---even though Nextel was operation in full compliance with the Commission’s rules.... Also see page paragraph 15 of NPRM 02-81.

⁵ See page 15 “PROMOTING PUBLIC SAFETY COMMUNICATIONS” (The White Paper) Nextel Communications, Inc November 21, 2001---largely due to intermodulation products formed in the officers’ radios... Also see page 14 of the White Paper – “As described in section V.A. below, the use of these differing system architectures in the 800 MHz band has created locally disparate signal strengths that, under certain circumstances, cause interference to public safety communications systems.” Also see paragraph 15 of NPRM 02-81

Equipment Design— It is reported ⁶ that the inherent design of the receiving equipment used in 800 MHz Public Safety radios make them more apt to some forms of adjacent channel interference. For example, strong signal components from the cellular or SMR operations may combine with the Public Safety receivers and generate over riding signals that block out weak on channels signals from the Public Safety transmitting facility. The received signal is weak due to the distance that the subscriber unit is from the base station.

The Commonwealth affirms the Commissions assertion that Commercial Mobile Radio Service (CMRS) interference to public safety is a serious problem.⁷ To that extent, the question arises; is the interference problem primarily related to interleaved channel assignments or equipment design? Or, is the problem the byproduct of loose or antiquated system design by the Commercial industry. Has the Commercial industry taken adequate precautions to Public Safety when planning their antenna designs or system build-outs? Should system design imply the taking into consideration of protection criteria, to nearby or adjacent channel Public Safety architectures. If there is a known problem in present design assumptions, are these design oversights being rectified in future implementations? Finally, do the present FCC licensing parameters and guidelines used for Commercial and cellular industries need to be critiqued?

III. Implications of re-banding of the 800 MHz Spectrum

With regard to band restructuring, we have two views: specific and global

A. Specific

The Commonwealth would be overly burdened with relocation. First, with whom would we be competing with for replacement spectrum? Also, would our replacement spectrum be an identical channel allocation or spectrum image of our former spectrum? Who would pay for the engineering studies on equipment and spectrum availability? Should a special coordinator be allowed to coordinate state assignments, allocated by NPSPAC? Additionally, there would be background disruptions and impacts that would affect our state colleges, institutions and agencies. If interference is being caused to a COV entity, the interferer should assume the responsibility.

⁶ See page 20 of the White Paper---Most public safety receivers “hear” and respond to RF energy in the adjacent.....The broad frequency response of public safety receiver equipment permits multiple RF emissions from SMR transmitters, cellular transmitters, or mixtures of both to combine in a public safety receiver and produce interference.

⁷ Section III, 16th paragraph, NPRM, WT-Docket No. 02-55

B. Global

As far as a global view is concerned, the Nextel proposal advocates a “Special Frequency Coordinator.”⁸ The advocating a “Special Frequency Coordinator,” would undermine the Congressional & Commission initiatives, specifically the NPSPAC committees and their procedures. NPSPAC was set up with local volunteers who know the territories and best approaches to licensing 800 MHz Public Safety spectrum in their respective areas. Nextel’s proposal would short-circuit this vital process. Next, the COV disagrees with the timetable as suggested by Nextel.⁹ Furthermore, a mass moving and reallocation of spectrum would be very time consuming task. This would be impractical and extremely burdensome to the volunteers and their respectful governmental employers. Any timetable or reallocation proposal of NPSPAC assignments must stipulate and take into account NPSPAC participation, resources and planning.

IV Funding Considerations

The COV emphasizes the removal of a funding cap for this solution. One realignment plan would commit 500 million dollars towards their version of a realignment of the spectrum. A 500 Million dollar funding limit may not be practical or reasonable for any practical or comprehensive solution. The COV suggest that the Commission thoroughly define the solutions for Public Safety interference, and then introduce or allow funding initiatives.

V Conceptual solutions for improving Public Safety Communications in the 800 MHz Band

Provide incentives—Perhaps the Commission could set aside a block of spectrum for volunteer, Public Safety, migration.

Priority moving or relocation--Those who have interference issues would have the highest priority in moving.

Funding initiatives--Those Public Safety entities, which voluntarily participate in a planed relocation, would receive funding both from the Commercial interest and the Federal Government.

Timetable--Allow a reasonable timetable to move from one spectrum block to another. Public Safety entities require a reasonable an amount of time. The taxpayers have to know what their localities are doing and be involved in a due process.

⁸ See P.37 of ‘Promoting Public Safety Communications’, Nextel Communications, Inc, November 21, 2001

⁹ See Pages-46 through 48 of ‘Promoting Public Safety Communications’, Nextel Communications, Inc, November 21, 2001

VI Concluding Comments

The Commonwealth is in favor of any plan that advances Public Safety Communications and the overall best interest of the general public. That any solution not overburden Public Safety commitment of its time, monetary resources, or due processes. Subsequently, that the Commission propose rules that will enhance good and sound RF engineering principles.