

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter)	
)	
Improving Public Safety Communications in the 800 MHz Band)	
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Consolidating the 900 MHz Industrial/Land Transportation and Business Pool Channels)	WT Docket No. 02-55
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**REPLY COMMENTS
OF THE CITY OF PORTLAND, OREGON**

The City of Portland, Oregon (“Portland”) submits these Reply Comments in response to the Commission’s Notice of Proposed Rule Making (“NPRM”) in the above-captioned proceeding.

General Comments on the Filings

Portland has reviewed many of the comments filed and as many of those making comments and reply comments have observed, there is widespread disagreement on the solution for this problem. We hope the major industry trade organizations can come together to work out a compromise recommendation. Portland has always believed in working together in the spirit of cooperation as evidenced by their working relationship with Nextel and other wireless carriers. However, these interim solutions may not be technically feasible, politically viable, or cost effective to implement. If Portland must spend nearly as much on an interim solution as

implementing a new system, why would we move down the road to an interim solution?

Portland believes the only ultimate solution is for Public Safety to have clear spectrum in the 700 MHz band to move to. We urge the Commission to move toward this solution with on a schedule that would allow systems to be licensed and implemented starting in 2006 or before.

Comments on Specific Issues In the NRPM

1. Portland believes it has demonstrated the parties involved can work cooperatively to resolve many of the interference problems in the short-term. This means the CMRS operators will likely not be able to implement all of the channels they desire because of interference in a particular area to public safety users. The FCC should require “voluntary” participation by all the CMRS providers involved in working out compromise solutions to the interference problems. A regional frequency coordination approach similar to that developed for the NPSPAC frequencies may be required between public safety and commercial frequencies while commercial providers have interfering spectrum assignments. At this time, the CMRS operators and in some cases the “A” band cellular carriers may need to change frequencies or reduce power and public safety may need to modify their radio units to improve intermodulation performance.

2. Portland views the approaches outlined in the NPRM (i.e., the Nextel and NAM proposals) as mid-term solutions. The initial solution is for the CMRS providers to recognize the role they play in this problem and that their involvement and cooperation are necessary components of the solution. The mid-term solution may be to modify the 800 MHz band allotments to increase frequency separation between the public safety licensees and cellular-like CMRS systems and the cellular “A” band. However, the following issues need to be considered:

- a. Moving all of public safety systems into a narrower band will create intra- and inter-system frequency coordination problems. Many large public safety systems use spectrum efficient “simulcast” technology¹ where they use a smaller number of channels to cover a large area. While this reduces the total number of channels required to cover a large area, it also reduces the flexibility in choosing channels.

- b. Most of the existing frequencies in any given area, certainly in any major urban area, are already used. The Commission did an excellent job of documenting this in their response to the Congressional inquiries.² This document also shows the magnitude of the problem in most urban areas. The frequency shifting process would require some “green” spectrum space so one of the systems could move and vacate frequencies to allow the other system to operate on those vacated frequencies. Virtually all of the public safety systems use fixed tuned equipment that would need to be re-programmed manually. This includes not only the RF infrastructure but also the controllers in many cases. This process is not affordable through conventional funding mechanisms available to local government, such as bond measures. It could

¹ Simulcast technology uses special engineering and technical systems to allow multiple transmitters on the same frequency to operate in a coordinated fashion. This allows a single set of frequencies to be used over a large geographic area without resorting to sites with large heights above average terrain. In many cases, this also allows lower individual site ERPs to be used because multiple sites are used to provide the coverage.

²FCC response to the Honorable W.J.(Billy)Tauzin, Honorable Vito J. Fossella, and Honorable Fred Upton, dated July 26, 2002, showing a detailed accounting of 800 MHz licenses and frequency interleaving.

involve much time, effort and resources to make the change, and would require complicated coordination. One approach would be to use the same band plan approach used in the 821/866 and 824/869 MHz “NPSPAC” to generate additional frequencies.³ If the technical and coordination issues can be resolved, this may create the additional channels needed in some areas.

- c. The band re-alignment approach would not resolve the interference problems currently being experienced by the Portland mobile data system.
- d. The planning and implementation of the refarming approach is expected to be very expensive. An estimated cost is not available due to the short time frame allowed for this response, but given the cost of simply replacing antennas previously discussed, the cost to retune and reprogram the Portland system could easily be more than 1,000,000 dollars.
- e. A band realignment must include a standard set of interoperability channels similar to the national calling and working channels defined for the NPSPAC frequency band.

³ This approach has several technical issues associated with it. The NPSPAC frequencies are spaced every 12.5 kHz but essentially use 25 kHz wide channels. This is accomplished by using a maximum deviation of ± 4 kHz instead of the ± 5 kHz used on the “806” channels. The RF infrastructure equipment could be re-aligned for the narrower deviation and the controller channel designations would need to be mapped to the new channels. This would require reprogramming every subscriber units which would be a significant task and would result in transition issues and planning as well.

- f. Portland believes a long-term “zero tolerance” interference solution may require moving public safety to a “public safety only” frequency band further separated from the existing frequencies. Portland understands this may require legislative action.

3. Portland believes some type of “extra-ordinary” funding method needs to be developed to assist state and local governments in making both frequency changes and re-design or redeployment of more efficient technologies. Portland proposes the Commission investigate the possibility of allowing current 800 MHz licensees to lease their channels within the footprint of their existing licenses to commercial wireless carriers as a way to finance moving their systems to 700 MHz. This approach has the following advantages:

1. The CMRS operators who obtain the frequencies would not have to change bands, could expand existing systems, implement new technologies that require contiguous spectrum, and have a defined cost of spectrum.
2. The existing system operators would obtain the funding required to move their systems from the existing 800 MHz frequencies to the 700 MHz band or other appropriate band.
3. This would need to be done in conjunction with the voluntary interference resolution procedures between all 800 MHz system operators in a given area proposed above. The CMRS providers would prioritize those areas where the interference and the

channel congestion was the greatest. This would result in the areas most in need moving the first.

In order to implement this approach, the Commission would need to specify that any funding obtained through spectrum leasing be used to implement and operate new systems in the 700 MHz band to avoid a municipality, county, or state government simply leasing the spectrum to obtain general fund dollars.

4. Portland suggests equipment manufacturers must do a far better job in addressing the interference issue. The Motorola reply comment addressing receiver intermodulation does not provide factual information, only general relative information.⁴ The letter states “*This requires an significant increase in current drain to these devices, by a magnitude of 4 to 5 times the existing power level.*” This does not really answer the question. The RF sections are only one item in a radio’s power budget. Maybe power levels could be reduced in other areas to maintain overall power consumption. Testing has shown the actual intermodulation protection of a typical 800 MHz portable radio at signal levels experienced in an urban environment to be in the range of 60-50 dB or worse.⁵ In addition, some radio equipment does not exhibit a linear intermodulation degradation curve further complicating the intermodulation problem. This situation is not tested

⁴Motorola letter dated June 20, 2002 to Michael J. Wilhelm, Designated Federal Officer, NCC, Federal Communications Commission, regarding receiver intermodulation specifications from Mr. Al Ittner, Manager, Spectrum and Regulatory Strategy, Motorola, Inc.

⁵These levels are often encountered within a few hundred meters of a CMRS cell site.

as part of the existing TIA specification.⁶ The existing specification only specifies and tests intermodulation performance at reference sensitivity which is not adequate. We urge the Commission to work with the TIA to develop a more meaningful testing approach that tests receiver intermodulation at signal levels starting at reference sensitivity and increasing every 3 dB until at least a level of -50 dBm is reached. In addition, intermodulation interference can occur from both A and B band cellular systems. The receiver front end of one popular portable radios used by public safety is clearly inadequate when measured and provides little or no selectivity to these out-of-band signals.

5. Portland continues to recommend a case study be performed to determine what would be involved in re-tuning a major system the size of Portland's or larger. This study should review issues not only with the system infrastructure but also with the process of making the transition and should include the issues with the commercial operators as well.

6. Portland urges the FCC to move quickly on this issue but not with undue haste because of the technical complexity of the issues. Portland has been dealing with these interference problems for six years with some success in reducing them. However, it takes constant vigilance and effort. At anytime, the addition of a Nextel site permanent or temporary, could result in a large area of poor or no coverage radio coverage. This could occur during a presidential visit, large

⁶Telecommunications Industry Association (TIA), ANSI/TIA/EIA-603-A-2001, August 15, 2001, Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

sporting event, or natural disaster with devastating results. Portland's public safety responders deserve better.

Conclusion

The issues facing public safety 800 MHz system operators, CMRS operators, and the FCC are daunting with no clear cut solution. Initial steps for resolution are:

- The FCC must send a clear message that this situation is a significant public safety issue and all parties, commercial and public safety, must work together cooperatively to provide the maximum immediate reduction in interference. The message should be clear that this is not simply a "Nextel" problem.
- Some type of 800 MHz frequency band realignment is needed, but significant technical and cost issues exist. This approach should be viewed as an interim solution to allow local agencies and CMRS providers to resolve local issues.
- Equipment available to public safety system operators must be improved. Portland urges the FCC to have an independent study done on how receiver performance could be improved to avoid manufacturer intransigence. Better industry standard measurement approaches need to be defined to better characterize receiver performance in high-rf levels. This information needs to be made available to radio equipment purchasers so they can make an informed decision.

- Frequency “green space” should be provided to facilitate any band realignment. This green space could be actual spectrum or additional channels created using technological methods.

- Portland urges the Commission to allow existing 800 MHz system licensees, to lease their 800 MHz spectrum to CMRS providers in order to obtain funding to move the existing public safety systems to the 700 MHz band.

- The long-term “zero tolerance” interference solution will involve a dedicated public safety frequency band with sufficient guard bands to provide adequate interference protection. This may require legislative action. We believe clearing space in the 700 MHz band is of utmost importance and the necessary legislative changes must be made.

Portland respectfully requests that the Commission proceed in this rule making in a manner consistent with the views expressed herein.

Respectfully submitted,

CITY OF PORTLAND, OREGON

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