

Before the
Federal Communications Commission
Washington DC 20554

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|--|---|----------------------|
| In the Matter of |) | |
| |) | |
| Amendment of Part 2 of the Commission's |) | |
| Rules to Allocate Spectrum Below 3 GHz for |) | |
| Mobile and Fixed Services to Support the |) | ET Docket No. 00-258 |
| Introduction of New Advanced Wireless |) | |
| Services, Including Third Generation |) | |
| Wireless Systems |) | |
| |) | |
| Petition for Rulemaking of the Cellular |) | |
| Telecommunications Industry Association |) | |
| Concerning Implementation of WRC-2000: |) | RM-9920 |
| Review of Spectrum and Regulatory |) | |
| Requirements for IMT-2000 |) | |
| |) | |
| Amendment of the U.S. Table of Frequency |) | |
| Allocations to Designate the 2500-2520/ |) | RM-9911 |
| 2670-2690 MHz Frequency Bands for the |) | |
| Mobile-Satellite Service |) | |

COMMENTS OF CLEARWIRE TECHNOLOGIES, INC.

Clearwire Technologies, Inc. (Clearwire) hereby files these comments in response to the March 30, 2001, Public Notice in the above-captioned proceeding, announcing release of the Commission's "Final Report" on the potential for accommodating 3G systems in the 2500-2690 MHz band.¹ Clearwire is a provider of wireless high speed Internet access, and manufactures equipment for two-way fixed wireless Internet access in the 2500-2690 MHz band.

¹ *FCC Releases Staff Final Report "Spectrum Study of 2500-2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems," Seeks Comment on Final Report in Pending Spectrum Allocation Proceeding, DA 01-786, in ET Docket No. 00-258 (released March 30, 2001).*

A. SUMMARY

The Commission's Final Report confirms that reallocating the 2500-2690 MHz band for 3G services is not feasible. The Final Report shows that 3G cannot share spectrum with the MDS/ITFS video and data services now in place. It further shows there not enough in-band spectrum for segmentation between MDS/ITFS and 3G, and no suitable spectrum elsewhere to relocate MDS/ITFS. Finally, even if segmentation or relocation were practicable from a spectrum standpoint, data in the Final Report shows the costs would be prohibitive.

B. THE COMMISSION'S FINAL REPORT CONFIRMS THE 2500-2690 MHz BAND IS NOT COMPATIBLE WITH 3G SERVICES.

This proceeding proposes to reallocate the fixed MDS/ITFS band (among other options) to 3G mobile services.² The band is presently used for fixed video and data (Internet) services. The proposed reallocation would necessarily entail at least one of the following: (1) operating fixed and mobile services together on the same frequencies; (2) segmenting the band between fixed and mobile; or (3) relocating the fixed services to some other band.

Clearwire, along with several other parties, has presented data to show that none of these options is practicable. The Commission's Final Report now confirms that conclusion.

A. Sharing Between Incumbent and 3G Services Is Not Feasible.

No party to this proceeding supports fixed and mobile operations' sharing the same spectrum. All appear to recognize the impossibility of maintaining adequate separation. The Final Report concurs:

² *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems*, ET Docket No. 00-258, Notice of Proposed Rule Making and Order, FCC 00-455 (released Jan. 5, 2001).

[I]f currently contemplated 3G systems were to share the same spectrum or channels in any given geographic area, large co-channel separation distances would be needed between 3G systems and incumbent ITFS and MDS systems. *Without adequate separation distances, 3G systems and ITFS and MDS would cause extensive interference to each other.*³

The Final Report quantifies the required co-channel separation at distances of 100-161 km,⁴ or possibly higher: the Commission arbitrarily sets 161 km (100 miles) as the distance to the radio horizon, and hence as the maximum interference distance.⁵

The Final Report notes that the 2500-2690 MHz band is licensed to ITFS and MDS systems in most populated areas of the country, where 3G licensees would presumably want to operate.⁶ The few areas where spectrum is not used by incumbent systems at full operational capacity would not support a viable 3G service.⁷

B. Relocation or Segmentation of Existing Users is Not Feasible.

1. The 2500-2690MHz band is heavily licensed and heavily used.

The Final Report documents the high levels of incumbent activity in the band:

³ Final Report at ii (emphasis added).

⁴ Final Report at 30 (Table 4.1).

⁵ Final Report at 29.

⁶ Final Report at 29.

⁷ Final Report at 29. Even if the same frequency could be allocated to fixed and mobile services in different geographical areas, it would be impossible to keep mobile end users out of fixed territory. Interference to the fixed service will result whenever a mobile transmitter passes through the antenna pattern of its receivers.

- 2,175 ITFS and 2,570 MDS licenses in place,⁸ operating over 124,000 transmitters;⁹
- 70,000 registered ITFS receive sites, with the number of locations at which ITFS programming is actually viewed likely to be much higher;¹⁰
- approximately *one million* wireless cable (MDS) customers;¹¹
- MDS "white space" auctioned in reliance on the current rules in 1996;¹² and
- MDS spectrum used for high speed Internet access by at least 27 licensees in dozens of markets, with applications filed for dozens more.¹³

The Final Report summarizes:

The 2500–2690 MHz band is in a state of rapid evolution by incumbent ITFS and MDS licensees. The MDS industry has invested *several billion dollars* to develop broadband fixed wireless data systems in this band, including high-speed access to the Internet. . . . This spectrum is heavily licensed throughout the country, with several licensees already providing high-speed Internet services to customers; other licensees are ramping up for full operational use in the very near term.¹⁴

⁸ Final Report at 14.

⁹ The average number of licensed transmitters exceeds 4,000 for each of 31 channels. Final Report at 44 n.87.

¹⁰ Final Report at 14.

¹¹ Final Report at A-19.

¹² Final Report at 20.

¹³ Final Report at 15-17 (details of providers, markets, licenses, and applications).

¹⁴ Final Report at ii (emphasis added). *See also* *id.* at 32 (all MDS spectrum encumbered throughout the United States); *id.* at 32, 36 (ITFS and MDS channels are generally fully deployed in each of the major metropolitan areas); *id.* at 82 & n.158 (Sprint and Worldcom expenditures of \$2.34 billion for spectrum in 168 markets).

This level of activity and development reflects the success of two distinct Commission policies: promoting MDS as part of the effort to develop a competitive market in multichannel video services;¹⁵ and encouraging the deployment of fixed, two-way, broadband Internet services in the MDS/ITFS bands as a competitive alternative to the DSL/cable duopoly.¹⁶

2. Available spectrum will not support either segmentation or relocation.

Segmentation. The Final Report evaluates three segmentation options. Each provides 90 MHz for 3G, although placement of the 3G spectrum (and guard band requirements) vary. Regardless of which option is considered, however, more than 60,000 MDS and ITFS transmitters would have to be retuned or replaced.¹⁷ It would also be necessary to relocate half of the million-plus receiver facilities, most of them in homes and schools.

Even then, however, the remaining spectrum would be insufficient to meet even current needs.¹⁸ MDS-band Internet providers would have to scale back data speeds, most likely to a level that would "reduce or eliminate that service's ability to compete in the marketplace" with

¹⁵ See, e.g., *Declaratory Ruling on the Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations*, 11 FCC Rcd 18839, 18841-45 (1996); *Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service*, 9 FCC Rcd 7665, 7666 (1994).

¹⁶ *Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, 13 FCC Rcd 19112, 19116-17 (1998), *recon.*, 14 FCC Rcd 12764 (1999), *further recon.*, FCC 00-244 (released July 21, 2000). See also Final Report at 13, 84 n.167 (only 44% of residential telephone plant compatible with DSL).

¹⁷ Final Report at 44-45. Segmentation is further complicated by the lack of uniformity in how the band is used in different markets. See Final Report at ii, 13.

¹⁸ Final Report at 46.

DSL and cable modems.¹⁹ Alternatively, maintaining the same quality of service would require drastically reduced cell sizes, to the point where 3-5 transmitters would be needed to replace each main transmitter currently in use.²⁰ Migration of current users would take until 2010 or beyond,²¹ well past the date when 3G providers hope to be offering service.

Relocation. Proposals to relocate current users are even less practical today than they would have been nine years ago, when the Commission last rejected the idea.²² Even then, the Commission found there were too many ongoing operations in the band, too many subscribers, too many pending applications, and no suitable alternative spectrum.²³ All of these same considerations still militate strongly against reallocation, much more strongly today than in 1992.

The Final Report concludes: "There is no readily identifiable alternate frequency band that could accommodate a substantial relocation of the incumbent operations in the 2500-2690 MHz band."²⁴ The Final Report examined in detail five bands and eight sub-bands as possible

¹⁹ Final Report at 54.

²⁰ Final Report at 55.

²¹ Final Report at 56.

²² *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, 7 FCC Rcd 6886, 6889 at para. 17 (1992).

²³ *Id.*

²⁴ Final Report at ii.

relocation destinations for MDS/ITFS operations.²⁵ In each case, the authors found that accommodating MDS/ITFS would be infeasible.²⁶

Even if spectrum could be found, the practical obstacles to relocation are formidable. The Commission's sole relocation experience to date involved only a few thousand point-to-point licenses, all operating from commercial sites, and no end users at all.²⁷ Yet even that relatively simple effort proved to be slow and contentious. Proponents of relocation here are silent on how they plan to tackle a job orders of magnitude more difficult, and which includes modifying or replacing equipment now used in hundreds of thousands of homes and classrooms.

3. Even if spectrum were available, the costs of segmentation or relocation would be prohibitive.

Segmentation would be expensive. The Final Report estimates the cost of relocating each ITFS facility at approximately \$500,000.²⁸ Segmentation would more than triple MDS/ITFS capital requirements, from \$2.7 to \$9 billion, and would almost double operating costs in the larger markets.²⁹ The net present value of these costs is about \$19 billion³⁰ -- high enough to

²⁵ Final Report at 59-80.

²⁶ Final Report at 65 (3700-4200 and 5925-6425 MHz band); *id.* at 70 (6425-7125 MHz, including 6425-6525, 6525-6875, 6875-7075, and 7075-7125 MHz sub-bands); *id.* at 71-72 (7125-8500 MHz) (Government band; limited information available); *id.* at 79 (10.7-13.25 GHz, including 10.1-11.7, 11.7-12.2, 12.2-12.7, 12.7-12.75, and 12.75-13.25 GHz sub-bands).

²⁷ *Plan for Sharing the Costs of Microwave Relocation*, 11 FCC Rcd 1923 at paras. 12, 14 (1995).

²⁸ Final Report at 85.

²⁹ Final Report at 87.

³⁰ Final Report at 88.

deter fixed wireless Internet offerings in most small markets and rural areas, and probably some large markets as well.³¹ The resulting loss of competition would tend to drive up the prices of broadband alternatives, particularly DSL and cable modem services. Where those alternatives are unavailable, homes, schools, and small businesses would simply have no access to broadband Internet.

The costs of relocating to a different band are much higher. Not only would all of the MDS/ITFS equipment nationwide have to be replaced, but incumbent operations in the destination bands would also have to be relocated³² -- assuming spectrum could be found for them.

One carefully-prepared estimate puts the cost of relocating traditional ITFS equipment (analog video) to a different band at \$19 billion.³³ This excludes the relocation of much larger MDS systems, with their million or so receiver terminals. It also excludes the "secondary relocation" costs of moving incumbents in the destination bands. Estimates for the latter range from \$10-30 billion.³⁴

In any combination, these numbers are hopelessly prohibitive. But the numbers are irrelevant. There is inadequate spectrum available for consideration of either segmentation or relocation.

³¹ Final Report at 88.

³² Final Report at 88.

³³ Final Report at 89.

³⁴ Final Report at 92.

CONCLUSION

The Final Report confirms that there is no room in the 2500-2690 MHz band for 3G services, and no way to make room.

All parties agree that spectrum sharing will not work. There is not enough in-band spectrum for segmentation, and not enough elsewhere for relocation. Even if spectrum could be found, either segmentation or relocation would entail costs in the tens of billions of dollars.

The Commission must place 3G services elsewhere in the spectrum.

Respectfully submitted,

/s/

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April 16, 2001

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