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THE WIRELESS COMMUNICATIONS ASSOCIATION INTERNATIONAL, INC.
THE NATIONAL ITFS ASSOCIATION
CATHOLIC TELEVISION NETWORK

October 7,2002

Mr. Thomas J. Sugrue
Chief, Wireless Telecommunications Bureau
Federal Communications Commission
455 Twelfth Street, SW
Washington, DC 20554

Re: Overview of MDS /ITFS Rule Rewrite

Dear Mr. Sugrue:

Six months ago, the Commission delegated to the Wireless Telecommunications Bureau responsibility for regulating the Multipoint Distribution Service ("MDS") and the Instructional Television Fixed Service ("ITFS"). Since that time, the Bureau staff has been examining carefully the current MDS and ITFS regulatory regime with an eye toward amending the Commission's rules in a manner that will expedite the deployment of innovative new commercial and educational service offerings using the spectrum. The Wireless Communications Association International ("WCA"), the National ITFS Association ("NIA"), and the Catholic Television Network ("CTN") – the primary representative organizations for the MDS and ITFS community – have been working together over the past several months to develop proposals that would assist the Bureau in its efforts. The results of that unprecedented collaborative effort are set out in detail in the white paper that is attached.

It has been more than four years since the Commission first adopted rules to permit the routine licensing of MDS and ITFS facilities designed to deliver two-way broadband video, voice and data services. Developments since then have made it clear that **if** advanced wireless services are to be viable in the MDS and ITFS bands, a radical reworking of the MDS and ITFS regulatory structure is needed – a reworking that will strip away decades of broadcast-style regulation and replace it with a more contemporary approach appropriate to the flexible nature of the services. The white paper advances detailed proposals designed to allow the Commission to free operations in the band from regulatory restraints that threaten to prevent widespread deployment of advanced commercial and educational wireless services using MDS and ITFS spectrum, while at the same time protecting incumbent ITFS educational operations. Primary among the benefits of the proposals advanced by WCA, NIA and CTN will be:

- elimination of unnecessary regulatory burdens and transaction costs imposed on MDS and ITFS licensees by the Commission's site-by-site licensing of all MDS and ITFS facilities;

- modification of the MDS/ITFS interference protection rules that have had the unintended effect of preventing licensees from providing ubiquitous two-way wireless services throughout their authorized service areas;

- establishment of a flexible bandplan that will accommodate and protect one-way high-power, high-site operations, while at the same time facilitating advanced two-way cellularized operations by imposing appropriate technical rules that afford each type of service assurance it can operate without interference from the other;

- elimination of a forty-year old interleaved channelization plan that prevents efficient utilization of spectrum and effectively gives each licensee a veto power over the service offerings of the licensee with which it is interleaved;

- removal of regulatory underbrush and conformation of the MDS/ITFS rules to Wireless Telecommunications Bureau standards for geographically-licensed flexible use services

WCA, NIA and CTN look forward to working closely with the Bureau in the coming months to develop a regulatory regime appropriate to emerging MDS/ITFS technologies We are confident that the attached white paper provides the Bureau staff with the necessary information to craft a comprehensive notice of proposed rulemaking. We urge the staff to do so expeditiously.

Respectfully submitted,

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A PROPOSAL FOR REVISING THE MDS AND ITFS REGULATORY REGIME

This white paper is submitted by the Wireless Communications Association International, Inc. ("WCA"), the National ITFS Association ("NIA") and the Catholic Television Network ("CTN") to assist the Wireless Telecommunications Bureau staff in its efforts to revise the rules and policies governing the Multipoint Distribution Service ("MDS") and Instructional Television Fixed Service ("ITFS").[1] It has been more than four years since the Commission first adopted rules to permit the routine licensing of MDS and ITFS facilities designed to deliver two-way broadband video, voice and data services.[2] Since then, much has changed with respect to the technology and economics of wireless broadband, consumer expectations regarding commercial and educational wireless services, and the Commission's regime for regulating MDS and ITFS. WCA, NIA and CTN believe that these changes mandate a radical reworking of the MDS and ITFS regulatory structure – a reworking that will strip away decades of broadcast-style regulation and replace it with a more contemporary approach appropriate to the flexible nature of the service. Their specific suggestions are set forth below.

I. BACKGROUND

The current regulatory regime for MDS/ITFS can be traced to decisions that in some cases are now four decades old. Indeed, the bandplan for the 2500-2690 MHz ("2.5 GHz") band – which provides licensees with multiple interleaved 6 MHz channels rather than contiguous spectrum – was established in the early 1960s when television technology precluded the use of adjacent channels, and has remained essentially unchanged since.[3] Meanwhile, the licensing, operational and technical rules for MDS and ITFS systems at 2.5 GHz and 2150-2162 MHz ("2.1 GHz") have their genesis in Commission decisions from the early 1980s. At that time, the Commission reallocated 66 MHz of spectrum at 2.5 GHz for MDS, allowed ITFS licensees to lease excess capacity and adopted licensing, operational and technical rules for the two services

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[1] WCA is the trade association of the wireless broadband industry. Its members include, ***inter alia,*** **MDS** and ITFS licensees, operators of virtually all of broadband systems based on MDS and ITFS spectrum in the United States, equipment manufacturers and engineering consultants. NIA, established in ***1978,*** is a non-profit, professional organization of ITFS licensees, applicants and others interested in the ITFS. The goals of NIA are to gather and exchange information about ITFS, to act as a conduit for those seeking information or assistance about ITFS, and to represent the interests of ITFS licensees and applicants. CTN is an association of Roman Catholic archdioceses and dioceses that operate many of the largest parochial school systems in the United States. CTN's members use ITFS frequencies to distribute educational, instructional, inspirational, and other services to schools, colleges, parishes, community centers, hospitals, nursing homes, residences, and other locations, and collectively serve over 500,000 students and 4,000,000 households throughout America.

[2] ***See 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 (1998)[*"MDS/ITFS Two-Way Report and Order"]; on recon.* 14 FCC Rcd 12764 (1999)[*"MDS/ITFS Two-way Reconsideration Order"]; on further recon.* 15 FCC Rcd 14566 (2000).

[3] ***See Amendment of Parts 2 and 74 of the Commission's Rules and Regulations to Establish a New Class of Educational Television Station of the Transmission of Instructional and Cultural Material to Multiple Receiving Locations on Channels in the 1990-2110 Mc/S or 2500-2690 Mc/S Frequency Band,*** FCC 63-722 (rel. July 30, 1963), ***on recon.*** 2 P&F Rad. Reg.2d 1619 (1964); ***Amendment of Sec. 74.902 of the Rules Governing Instructional Television Fixed Stations to Assign Alternate Channels to Stations Operating in the Same Area Instead of Every Sixth Channel,*** 2 P&F Rad. Reg.2d 1615 ***(1964).***

designed primarily to promote wireless cable and educational television services! Although licensees were not restricted to the provision of video services, those rules were premised on certain assumptions drawn from the then - predominant commercial and educational video uses – that a licensee would be providing one-way downstream service, that it would be serving its receive sites from a single high-power, high-site transmitting location, that once the technical parameters of the station were set they would not frequently change, and that protection of existing operations was of paramount importance, even if the result was to retard the introduction of new stations. Not surprisingly, the rules adopted for MDS and ITFS in the early 1980s were strikingly similar to those imposed on television broadcasters, which shared the same fundamental characteristics. Those rules, in a nutshell, required prior Commission approval on a site-by-site basis before virtually any new or modified facilities could be deployed, imposed on licensees highly-conservative interference protection rules, required applicants to prepare and file with their applications complex interference analyses demonstrating compliance with those rules, and subjected licensees to substantial delays between application and grant.

Through a series of decisions during the late 1980s and early 1990s, the Commission whittled away somewhat at the overly-regulatory regime, a regime that was severely hampering the deployment of wireless cable and educational services in many markets.[5] Unfortunately, those actions were too little, too late, and by the mid-1990s it had become clear that the growth of Direct Broadcast Satellite and 100+ channel cable systems had closed the window of opportunity for wireless cable in all but the relatively few markets where wireless cable had gained a foothold. At the same time, however, it was becoming increasingly evident that MDS and ITFS spectrum could be successfully repurposed to provide high-speed broadband services for the commercial and educational markets.[6] The industry's efforts to evolve into the

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[4] *See Amendment of Parts 2, 21, 74 and 94 of the Commission's Rules and Regulations with Regard to its Frequency Allocations to the Instructional Television Fixed Service, the Multipoint Distribution Service, and the Private Operational Fixed Microwave Service, 94 F.C.C.2d 1247 (1983)*["*Docket 80-112 R&O*"]; *Amendment of Parts 21, 43, 74, 78 and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands affecting: Private Operational Fixed Microwave Service, Multipoint Distribution Service, Multichannel Mullipoinl Dislribulion Service, Instructional Television Fixed Service, and Cable Television Relay Service,* 5 FCC Rcd *6410* (1990)["*1990 MDS/ITFS Report and Order*"]; *Amendment of Parts 21, 43, 74, 78 and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multichannel Multipoint Distribution Service, Instructional Television Fixed Service, and Cable Television Relay Service, 6* FCC Rcd *6792* (1991)["*OFS Reallocation Order*"].

[5] *See, e.g., 1990 MDS/ITFS Report and Order, on recon. 6* FCC Rcd *6764 (1991); Amendment of Part 74 of the Commission's Rules with Regard to the Instructional Television Fixed Service, 9* FCC Rcd *3348 (1994); Revisions to Part 21 of the Commission's Rules Regarding the Multipoint Dislribulion Service, 2* FCC Rcd **4251** (1987).

[6] That repurposing, it should **be** noted, was accomplished without any change in the underlying purpose **of** MDS. While the service had in the *1980s* evolved primarily into a video service, the Commission had always permitted MDS to be used for a wide variety of services, including voice and data services. *See 47* C.F.R. § 21.903(b). *See also Amendment of Parts 1, 2, 21, and 43 ofthe Commission's Rules and Regulations To Provide for Licensing and Regulation of Common Carrier Radio Stations in the Multipoint Dislribulion Service, 45* F.C.C.2d *616, 633* (1974)["*Initial MDS Order*"]; *Amendment of Parts 21 and 74 of the Commission's Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Fixed Television Service and Implementalion of Section 309(j) ofthe Communications Act – Competitive Bidding, 10* FCC Rcd *9589, 9619 (1995) ["MDS BTA Auction Order*"]("[U]nless otherwise directed or conditioned in the applicable instrument of authorization, Multipoint Distribution Service stations may render any kind of communications service consistent

broadband arena came to a head in 1997, when a coalition of over 100 MDS and ITFS licensees, system operators, consultants and equipment vendors petitioned the Commission to permit the routine licensing of MDS and ITFS stations for two-way broadband services?

The Commission's subsequent decisions in MM Docket No. 97-217 allowing the routine licensing of MDS and ITFS stations for two-way services were widely viewed as a positive step forward within the MDS/ITFS community! Yet, because the Commission's decisions in the docket were even more protective of incumbent operations than the prior rules, requiring a potential applicant to undertake interference analyses based on so many worst case assumptions that it has proved virtually impossible for system operators to provide ubiquitous coverage within their territories? To cite one example, an applicant is required by the complex "Appendix D interference-prediction methodology to assume in conducting analyses that each and every one of its subscribers is located at the very point most likely to cause interference to a neighbor. In other words, an applicant proposing to provide service on a given channel to 1000 subscribers simultaneously is required to assume that all 1000 subscribers will be at the very spot most likely to cause interference. Unfortunately, these hypothetical assumptions, for all practical purposes, precluded system operators from serving substantial portions of their authorized territories.

Moreover, once systems are designed to comport with the new rules, the system operator and its affiliated licensees must submit detailed applications for Commission approval of the system design and wait months for grant of those applications. Indeed, even minor changes to a system design, such as changing the base station beam tilt to assure coverage of unanticipated "dead zones," require detailed interference analyses, formal applications and substantial delay. The ultimate irony is that the Commission-mandated model for interference analysis is so complicated that high-powered computer workstations and very expensive software are required to review the analyses being filed with applications and, since the Commission staff lacks these tools, the Commission is unable to police compliance with its own rules.

Despite the difficulties with two-way licensing, the industry has soldiered on, and it was not long after the Mass Media Bureau started issuing licenses for the operation of two-way facilities in the MDS and ITFS bands that MDS/ITFS based broadband systems began to experience explosive growth. Several operators began deployment of first generation two-way systems in the spring of 2000. That deployment established significant consumer demand for

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with the Commission's rules on a common carrier or non-common carrier basis."), ***on recon.,*** 10 FCC Rcd 13821, 13824 (1995)("[T]he present regulations allow for use of MDS frequencies for 'any kind of communications service"') (internal citations omitted).

[7] ***See*** Petition for Rulemaking of The Wireless Cable Association International, Inc., *et al*, RM-9060 (filed March 14, 1997).

[8] *MDS/ITFS Two-Way Report and Order*, 13 FCC Rcdat 19116-17.

[9] Instead, applicants for upstream authority often must designate as "response service areas" small portions of their protected service areas selected not because of consumer demand or other service considerations, but because they pass muster under the highly-conservative interference protection rules. The result is that system operators often are unnecessarily denied the ability to secure licenses to provide two-way service where consumers are demanding service.

wireless broadband services. Sprint, for example, began deployment in March, 2000 in Phoenix, AZ and in 13 additional cities over the next year. Sprint installed over 10,000 customers in just under six months in Phoenix alone and, in Tucson, Sprint attained a **3%** penetration rate of available households in just four months. After one year of operations and after ramping up operations in all these markets Sprint's sales of fixed wireless, broadband Internet access services were averaging over 2,000 a month." However, as is now well-known by the Commission, issues associated with the first generation of two-way technology soon became apparent, and many in the industry chose to halt the deployment of additional first generation systems (particularly those focused on serving the consumer market in urban and suburban areas) until those issues could be addressed." Nonetheless, this early experience with first generation MDS/ITFS technology has proven valuable, as it demonstrated beyond peradventure that there is a substantial market for wireless high-speed broadband services.

While first generation technology is likely to continue to have a role in the industry for some time, the early experience highlighted that the technology's requirement for an unobstructed direct line-of-sight path between the base station antenna and the subscriber antenna imposes substantial limitations on system operators. **As** a practical matter, this line-of-sight requirement forces operators of first generation technology to deploy a "supercell" network design – a design that features a single high-power base station at a high-site location (atop a mountain or on a tall building or tower).[12] The reason is simple – the taller the base station, the more likely it is that there will be an unobstructed path from the base station antenna to a potential subscriber.[13] On the subscriber end of the link, the line-of-sight requirement effectively mandates the installation of a high-gain directional antenna approximately the size and shape of a pizza box outside the subscriber's home or office. To assure the required unobstructed transmission path, the antenna has to he mounted above the ground clutter (buildings, trees, and topology) -- on chimneys, on masts attached to the roof, or just under the eaves. Because the supercell architecture leads to base stations being located relatively far from many subscribers, consumer equipment often has to operate at relatively high EIRP levels (achieved through a

[10] An extraordinary number of Sprint's customers have remained on Sprint's first generation network, even after Sprint halted all sales activities in November, 2000. System wide, for the period of January through August of current year, the chum rate for Sprint's Broadband Direct customers is only 2.1%, well below the churn rate (of the 3%) for CATV and PCS customers and far below the (8%) chum rate for long distance customers. Of the over 50,000 Sprint Broadband Direct Internet Access customers who signed up for service before Sprint halted customer acquisitions, over 43,000 remained customers as of August 31,2002.

[11] See, *e.g.*, "Sprint to Terminate ION Efforts; Announces Additional Actions to Improve Competitive Positioning and Reduce Operating Costs in FON Group," at http://www3.sprint.com/PR/CDA/Pr CDA Press Releases Detail/1,3245,3921,00.html (Oct. 17, 2001) (announcing Sprint's discontinuance of new first generation deployments pending review of second generation technology).

[12] Indeed, in most cases the operator of a first generation wireless broadband system utilized the same antenna supporting structure that had been used in the market for the high-power, high-site wireless cable service.

[13] While some cellularization was attempted, the potential for cochannel interference from high-power, high-site cells posed a substantial challenge and first generation cellular designs called for only a handful of cells. As a practical matter, first-generation cellular systems have more in common with high-power, high-sitc operations than with the cellularized systems that are being developed with the next generation of technology.

combination of transmitter output power and a high-gain antenna). Given the relatively high EIRP levels involved with these distant receive sites, the operator of a first generation system is required to professionally install reception equipment at every subscriber location, and each installation costs the operator far more than the competitive marketplace allows it to recover from the Subscriber in installation fees. Furthermore, the line-of-sight requirement means that expensive "truck rolls" often are made to potential subscribers that ultimately cannot be served because no unobstructed transmission path exists between their location and a base station.[14]

That first generation technology requires relatively large antennas mounted on or near the roof has presented the industry with problems familiar to the Commission from its ***Competitive Networks*** proceeding. Despite the Commission's efforts to preempt unreasonable restrictions on broadband antennas, system operators are still plagued by local zoning and homeowner's associations restrictions that burden the deployment of service. And, the rooftop antenna requirement makes it far more difficult for MDS/ITFS systems to serve multi-tenant buildings, as landlords frequently either refuse to permit the installation of rooftop antennas and internal wiring or require the system operator to pay substantial fees in order to gain access to the premises (placing MDS/ITFS at a competitive disadvantage against cable and DSL technologies that generally have free access to multi-tenant buildings).

The requirement for an unobstructed transmission path with first generation technology also means that MDS/ITFS-based wireless broadband service operators have been unable to provide portable broadband service to the growing base of laptop and Personal Digital Assistant ("PDA") users. As the Department of Commerce recognized less than two weeks ago, "wireless broadband solutions offer a mobility and convenience that significantly increase demand. Just as mobility has expanded the number of minutes people use for voice, we can reasonably expect the same stimulative effect from mobile high-speed data."[15] The explosive growth of 802.11b compliant "hot spots" establishes the demand for this sort of service – a service that MDS/ITFS based systems could provide ubiquitously (not just at "hot spots") if they could overcome the line-of-sight requirement. While the Commission's ***First Report and Order*** in the ***Advanced Wireless Services*** proceeding was clearly intended to open this market, as well as other potential

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[14] See, *e.g.*, Blackwell, "What the Liccnscd Competition is Doing," available at http://isp-planet.com/fixed_wireless/business/2002/sprint_020528.html (May 28, 2002) ("It might turn out that only half the prospective customers responding to [Sprint's] marketing campaign could actually secure [line-of-sight]. But to determine which could and which could not, Sprint still had to send out technicians to do site surveys on all prospects. And then installation for those prospects who could see the base station took a minimum of 90 minutes... 'In total,' [Sprint Vice President of Integrated Products and Market Planning Cameron] Rejali says, 'it really hurts your profit and loss – both on install as well as acquisition costs. Right up front, you have a big expenditure to get customers on.'"].; "LMDS, MMDS Making Slow Progress in the United States," available at http://www.broadband.globalsources.com/MAGAZINE/BB/0205/LMDS01.HTM (Mar. 21, 2002) ("[According to one MDS vendor], [i]t was found that provisioning a new [MDS/ITFS broadband] customer requires an average of three truck rolls, so that labor costs actually outweighed the customer premises equipment (CPE) price.").

[15] Office of Technology Policy, US Department of Commerce, "Understanding Broadband Demand: A Review of Critical Issues," at 21 (rel. Sept. 23,2002).

portable, nomadic and mobile markets, to MDS and ITFS licensees," a second generation of technology that could overcome the line-of-sight requirement was required to bring the Commission's objective to fruition.

The vendor community has been sensitive to the concerns arising from the line-of-sight requirement, and has developed a new generation of technology that does not require an unobstructed path between the base station and the subscriber, does not require high-power, high-site base stations, does not require high-gain outdoor antennas at subscriber locations, and thus does not require professional installations. Indeed, this next generation of technology features consumer equipment that is so small and operates at such low EIRP levels it readily can be attached to portable devices such as laptops and PDAs. This new generation of subscriber equipment comes in a variety of form factors – some the size of a cable modem, others the size of a PDA, and some soon to be as small as a PCMCIA card." The effect on the industry is proving revolutionary – cost-prohibitive professional installation of pizza-box-sized reception antennas on rooftops is no longer necessary – a consumer can purchase his or her CPE at a retail outlet, plug it in, and be operating in a matter of minutes. This second generation of MDS/ITFS

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[16] ***See 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 System,*** 16 FCC Rcd 17222, 17236(2001)(" IPW has developed and is testing technology for portable data services that it claims can operate under existing ITFS/MMDS service rules (i.e., not cause harmful interference to incumbent one-way and two-way fixed services) without disrupting the provision of fixed services in the **2500-2690** MHz hand. The addition of a mobile allocation will facilitate the introduction of these types of services and will provide flexibility for introducing other mobile applications in the future, thereby encouraging technology development and investment. We emphasize that this addition merely increases options for incumbents to employ spectrum in its highest-valued use, consistent with prior Commission policy, and does not change existing ITFS/MMDS service or technical rules.").

[17] ***See, e.g.,*** Marek, "Houston Trial Tests MMDS' Limits," ***Wireless Week,*** at 1, 34 (September 23, 2002)("[Navini] soon will offer the current CPE, which looks like a sleek computer modem with a small antenna, in a PCMCIA card version."); ***Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable And Timely Fashion, and Possible Steps To Accelerate Such Deplayment Pursuant to Section 706 of the Telecommunications Act of 1996,*** 17 FCC Rcd **2844,2924** n.451 (2002) ("NextNet Wireless, Inc. has developed an end-to-cud MDS system with a desktop customer-premises unit that requires no rooftop antenna and no inside wiring connections. IPWireless, Inc. has developed a technology that will allow its customers to utilize modems inside buildings under non-line-of-sight conditions.") NextNet, Inc. describes its Experience™ system as featuring "unique customer premise equipment [that] integrates the modem, transceiver and antenna into a single compact, indoor, portable unit that is completely customer-installable." ***See*** http://www.nextnetwireless.com/products.html. IPWireless, Inc., a leading developer of second generation technology that currently offers a pocket-sized broadband wireless access CPE device, recently announced an agreement with a Swedish firm that will result in the development of PC Card CPE. According to the company: "The IPWireless PCMCIA card, available in early 2003, will deliver the same reliable, mobile, wide-area broadband experience as the IPWireless pocket-sized Advanced 3G modem that customers are using worldwide today. By offering an end user device in an even simpler form, IPWireless enhances and extends the simplicity and mobility of its international standards-based, plug-and-play mobile broadband technology. The jointly developed PCMCIA card marks the first in a series of innovative devices to be created by IPWireless and Wireless House that will seamlessly integrate universal mobile telecommunications service (UMTS) connectivity into mobile devices, furthering the IPWireless vision of broadband everywhere by ensuring uninterrupted broadband access anywhere in the world – whether in a house, an office,at an airport, or on a train." ***See*** http://www.ipwireless.com/press_072402.html.

broadband technology has already been deployed in several markets, and is being actively evaluated by the industry's largest system operators.[18]

Unfortunately, the flaws inherent in the broadcast-style approach to regulating MDS and ITFS two-way operations are only being magnified by the emergence of the next generation of MDS/ITFS broadband technology. More specifically:

- The current broadcast-like interference analysis, application and licensing process puts a substantial burden on licensees and the Commission's staff even when most operators were licensing first generation supercell systems that required just 6-12 applications each." Because second generation technology utilizes a more highly-cellularized network architecture, it will take orders of magnitude more applications to license a single densely populated market for second generation service under the current system. Indeed, one system operator has made a preliminary assessment that close to two thousand applications could be required under the current rules to fully license the *2.5* GHz band for a second generation system in one major market. The Commission licensing system that strained under the weight of 2267 applications in the first filing window would likely collapse were second generation filings to begin in earnest under the current rules.[20]

- The current application and licensing system requires a licensee to file and prosecute an application for authority to make even modest modifications to previously-licensed facilities. These modification applications are as complex as an application for a new

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[18] *See, e.g.,* Marek, "Cleanvire Commits to Commercial Launch,," ***Wireless Week,*** at X (Sept. 30, 2002) (reporting on plans by Clearwire to utilize IPWireless technology to launch MDS wireless broadband service in major market by Jan. 3, 2003); Mansell, "IP Wireless Gaining Customers," ***Kagan Broadband Fixed Wireless,*** at 6 (May 6, 2002) ("... WorldCom and Sprint ... along with [MDS/ITFS operator] Nucentrix, are now trialing a new generation of suppliers led by the likes of Navini, IP Wireless, Vyyo, Iospan, BeamReach and NextNet."); "Sprint Conducts Trials with Next Generation Broadband Wireless Technology," Sprint Corporation Press Release (May 7, 2001); Chamy, "Can Your Net Access Travel Through Walls?" ***CNET*** *News.com* (May **7,** 2002); Blackwell, "What the Licensed Competition is Doing," at http://isp-planet.com/fixed wireless/business/2002/spring 020528.html (May 28, 2002). See ***also*** "NextNet Announces Industry's First Commercial Deployment of Next Generation NLOS Broadband Wireless Access," at http://www.nextnetwireless.com/press releases 23 bottom.html (Jan. 10, 2002) (announcing launch of commercial MDS/ITFS broadband service with second generation equipment in Pocahontas, Iowa); Manscll, ***supra*** (discussing plans by Montana Wireless TV of Missoula to roll out second generation equipment); Sing, "Next-Generation Wireless Comes to Maui," ***Pacific Business News*** (Apr. 19, 2002), at http://pacific.bizjournals.com/pacific/stories/2002/04/22/story1.html (discussing launch of third generation or "3G mobile broadband service over MDS/ITFS spectrum in Maui, Hawaii); "LMDS, MMDS Making Slow Progress in the United States," at http://www.broadband.globalsources.com/MAGAZINE/BB/0205/LMDS01.HTM ("Experts agree that there may be a half-dozen firms readying [second generation] MMDS offerings. 'A lot of vendors are working on [non line-of-sight] MMDS systems, and hope to have them up and running this year,' [Peter] Jarich of the Strategis Group said.").

[19] Because a system is generally made up of facilities licensed to multiple licensees, the number of applications per cell can range upwards of a dozen or, in some extreme cases, even more.

[20] During the initial August 14-18, 2000 filing window for MDS/ITFS two-way applications, 2267 two-way applications were filed. The first of several waves of grants did not occur until April 6,2001 – eight months later.

station, and the delays between filing and grant are identical. That approach **was** marginally acceptable for regulating first generation supercell systems that tend to be static, requiring relatively few modifications once built. However, it imposes substantial transaction costs on licensees of second generation networks, which will inevitably be very dynamic. This is primarily because base stations are closer to the ground and subscriber antennas are often at ground level (rather than on building roofs or just under the eaves). As a result, system coverage is substantially impacted by buildings and foliage that are difficult to model precisely prior to system deployment. Moreover, particularly in urban areas the constant construction of new buildings is likely to require frequent tinkering with network designs. As a result, as with broadband **PCS** systems, second generation MDS/ITFS network operators constantly will be adjusting base station antenna orientations and beam tilts, changing antenna heights, adding or subtracting sectors, altering power levels and adding new cells. These modifications, which licensees in other flexible use services can make when and if necessary without prior Commission approval, cannot he made by MDS/ITFS system operators under current Parts 21 and 74 without incurring the substantial costs and delays inherent in the current broadcast-like regulations.

- Although MDS/ITFS spectrum is capable of being deployed in a manner that provides ubiquitous coverage, the current, overly-preclusive interference protection rules effectively prevent system operators from securing licenses for the facilities needed to provide the ubiquitous coverage required for a viable commercial service to portable, nomadic and mobile laptops, PDAs and other non-stationary devices. Consumers want access to their broadband services "anywhere, anytime," and an MDS/ITFS-based service unnecessarily restricted by the interference rules to serving just isolated areas is unlikely to find marketplace acceptance.

- Because of concerns that consumer units might cause "brute force overload" interference to ITFS receive sites equipped with broadband downconverters, the Commission in the ***MDS/ITFS Two-Way Report and Order*** required the professional installation of equipment at consumers' locations;' mandated advance notice to nearby ITFS receive sites prior to commencing two-way services to nearby consumer locations,[22] and banned

[21] ***See*** *MDS/ITFS Two-Way Report* and Order, 13 FCC Rcd at 19141 ("Response stations should not be installed by end users and we are therefore adopting a requirement that all response stations be installed by the hub station licensee or its employees or agents. Given the interference environment in which response stations will operate, we do not believe it would he prudent to permit them to be installed by nonprofessionals with no knowledge of the protection requirements for nearby ITFS receive sites.").

[22] See ***id,*** at 19142 ("With respect to the potential for BFO interference, we agree with CTN that, in certain limited circumstances, ITFS receive sites could be adversely affected by downconverter overload and that some appropriate relief should be available. CTN is correct that the interference from digital response stations will be 'noise like' and thus will present significantly greater problems than current analog emissions in terms of evaluation and location of the responsible transmitters. Additionally, as it is highly likely that, in many instances, the interference will be intermittent, as various response stations alternate transmissions with each other and with booster and/or main stations, solving such interference problems will clearly require a highly coordinated and cooperative effort between system licensees. For these reasons, we are adopting CTN's request to require a hub station licensee to formally

the use of omnidirectional antennas at consumer locations.[23] Although limited exemptions to those requirements were subsequently adopted? these restrictions present substantial economic and operational impediments to the commercial deployment of second generation technology Consumers already can purchase competitive cable modem and DSL services at a wide range of retail locations. They are unlikely to find an MDS/ITFS service attractive if it cannot also be purchased at Best Buy, Circuit City or Radio Shack, plugged in, and enjoyed immediately. Thus, although the current "brute force overload" rules protect educational ITFS receive sites, they also impede use of the retail model for distributing MDS/ITFS services, particularly where the system is designed to serve the portable, nomadic and mobile devices the Commission has sought to promote.[25]

- On the flip side of that same coin, the rules designed to protect ITFS receive sites from brute force overload are premised largely on the use of subscriber transmission equipment either that is at a fixed location known to the system operator or that operates at -6 dBW or below. With the marketplace demanding deployment of non-stationary services that require higher power levels and the Commission seeking to promote MDS/ITFS as a provider of those services, the continued efficacy of the rules for protecting reception at ITFS receive sites is called into question.

- The current interleaved bandplan, coupled with the current adjacent channel interference protection rules, effectively preclude any licensee from providing broadband service unless consent is received from the licensee of the interleaved channel group (*i.e.* the licensee of the A Group cannot deploy two-way services without consent from the licensee of the B Group, and ***vice versa).*** The interleaved bandplan was adopted because 1960-era television sets used for ITFS reception could not receive adjacent channels without interference.[26] The rationale for the interleaved bandplan is long gone -- wireless cable systems have been demonstrating the ability of MDS and ITFS video operations to use adjacent channels for the past 20 years. This interleaving is not only obsolete -- it

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notify an **ITFS** licensee when a response station is to be located **in** the vicinity of any of the ITFS licensee's receive sites. Specifically, we are creating a notification zone with **a** radius of 1960 feet around each ITFS receive site, and we will require that, at least **20** days prior to the activation of any response station within such a zone, the hub station licensee notify, by certified mail, the appropriate **ITFS** licensee. The notification must contain the street address and geographic coordinates of the response station, a specification of the station's EIRP, antenna pattern, orientation, polarization and height **AMSL,** channels to he used, as well as the name and telephone number **of** a contact person who will be responsible for coordinating the resolution of any interference problems.").

[23] ***See MDS/ITFS Two-Way Reconsideration Order,*** **14 FCC** Rcd at **12781** (retaining restriction **on** omnidirectional consumer unit antennas except for those operating at **-6** dBW to "provid[e] adequate protection from harmful interference to all systems").

[24] ***See id.*** at 12177-79 (eliminating need for advance notice **or** professional installation of customer units operating at +18 dBW EIRP or less provided that upgraded downconverters are installed at the registered receive sites of neighboring **ITFS** licensees).

[25] ***See supra*** note 16.

[26] ***See supra*** note ***3.***

now hampers the ability of individual MDS and ITFS licensees to deploy broadband services by giving adjacent channel licensees a "veto power" over any proposed offering. Concerns over adjacent channel interference are better addressed by the spectral mask and out-of-band emission rules, as they are in other services.

- As the Commission recognized in developing rules for the upper 700 MHz band and as is at the heart of the effort to refarm the 800 MHz band, high-power, high-site systems are fundamentally incompatible with low-power cellular systems.[27] Similarly, in the MDS/ITFS environment the intermixing of the two types of services has caused two types of problems. First, high-power, high-site one-way operations tend to cause interference to cochannel cellular system base stations that are located quite far away. This is because those base stations feature relatively sensitive reception antennas (to "hear" signals from low-power subscriber equipment) and those base station antennas generally are located above the ground clutter (and thus more likely to have an uninterrupted transmission path from the cochannel high-power, high-site station in a neighboring market). Thus, these base stations are by their nature sensitive to cochannel interference." Second, transmissions from portable, nomadic and mobile subscriber equipment in cellular networks pose the potential to cause brute force overload of close-by equipment used to receive high-power, high-site services. As noted above, the current rules designed to protect high-power, high-site ITFS receive sites from this sort of interference impose substantial burdens on system operators and do not accommodate non-stationary consumer equipment. Thus, a new approach is required to addressing the potential for brute force overload.

In short, the MDS/ITFS-based broadband industry continues to evolve to meet consumer demand and educational needs for innovative new services, and the Commission's rules must keep pace. However well-intentioned, the rules and policies adopted by the Commission in 1998 to govern MDS/ITFS two-way services have proven too restrictive to meet the needs of the marketplace in 2002 and beyond. If not substantially modified, the current licensing regime of Parts **21** and 74 will effectively preclude commercial operators and educators from taking advantage of the substantial opportunities that next generation MDS/ITFS technology offers for the provision of commercial services and educational applications. This white paper has been prepared by WCA, NIA and CTN, after consultation with MDS and ITFS licensees, system operators, equipment vendors and engineering experts, to advance specific suggestions as to how the Commission can alter its rules.[29]

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[27] *See* ***Service Rules for the 746-764 and 776-794 MHz Band. and Revision to Parr 27 of the Commission's Rules,*** 15 FCC Rcd 476, 483-86 (2000)["*Upper* 700 *MHz First R&O*"]; ***Improving Public Safety Communications in the 800 MHz Band,*** 17 FCC Rcd 4873, 4877-82 (2002).

[28] *Cf.* ***Upper 700 MHz First R&O,*** 15 FCC Rcd at 485

[29] WCA formally commenced the process of re-examining the MDS/ITFS regulatory regime in April of this year when it created a Technical Task Group within its Engineering Committee to explore a variety of technical issues presented by concerns over the efficacy of the current rules. That Technical Task Group, which was open to all WCA members and invited representatives of the ITFS community (including NIA and CTN) ultimately grew to

In crafting these proposals, the primary objectives have been to:

- Modify the MDS/ITFS rules to facilitate deployment of next generation low power, cellular systems that can operate on fixed, portable, and/or mobile bases without interference from high power systems.

- Provide for continued downstream transmission of high-power, high-site services by licensees that choose to do so.

- Establish a new bandplan for the 2.5 GHz band which provides for the isolation of high-power, high-site one-way systems from two-way cellular systems to facilitate interference protection.

- Eliminate the site-by-site licensing system for cellular systems and replace it with rules modeled on Part 27 allowing licensees the freedom to construct and operate facilities within geographic service areas, subject only to compliance with technical rules intended to minimize interference between systems, antenna structure requirements and RF emission limits.

- Remain technology-agnostic to the maximum extent possible.

- Establish a market-by-market mechanism for transitioning from the old bandplan to the new, and provide for the proponent of a given transition to pay the expenses of migrating ITFS video and data services to the appropriate spectrum in the new bandplan, while at the same time assuring that an individual licensee cannot unreasonably block the transition in any market.

- Remove regulatory underbrush and conform the MDS/ITFS rules to Wireless Telecommunications Bureau standards for geographically-licensed flexible use services.

What follows are the specific proposals developed by WCA, NIA and CTN to achieve these objectives or, to the extent that the industry has been unable to reach consensus on an issue, a discussion of the issue. WCA, NIA and CTN urge the Commission to promptly issue a notice of proposed rulemaking proposing to adopt the instant proposals and seek additional input on the issues where consensus is lacking. In the interim, WCA, NIA and CTN are committed to continuing their exploration of the unresolved issues, and will report to the Commission on progress as it occurs. In addition, WCA, NIA and CTN intend to submit to the Commission a comprehensive set of specific rules for governing MDS and ITFS to supplement the discussion in this paper.

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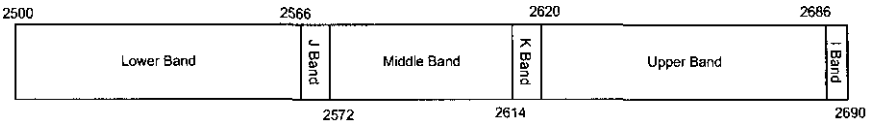
over 70 *members*, has **held over 50 conference** calls **to date, and exchanged hundreds** of emails. **In addition,** WCA's Government **Relations** Committee, NIA's **Board** of **Directors and** CTN's **Board** of **Directors have devoted innumerable hours to discussing and crafting an approach** that **best meets the needs** of **their** respective **constituents.**

II. THE PROPOSED NEW BANDPLAN

At the heart of the proposed rules is a new 2.5 GHz band plan that is illustrated as follows:



The new bandplan has been designed to provide every licensee with the same quantity of spectrum it currently has under the interleaved bandplan, but to distribute that spectrum in a contiguous manner among different segments of the new bandplan.'" The new bandplan features three major band segments – the Lower Band Segment ("LBS") with twelve 5.5 MHz wide channels extending from 2500-2566 MHz, the Mid Band Segment ("MBS") with seven 6 MHz wide channels extending from 2572-2614 MHz, and the Upper Band Segment ("UBS") with twelve 5.5 MHz wide channels extending from 2620-2686 MHz. The current I channels will remain at 2686-2690 MHz and continue to provide a 125 kHz channel for each current channel, although the channel assignments will be deinterleaved. Transition Bands (the J and K channels) will be established between the LBS and the MBS and between the MBS and the UBS -- for each LBS and UBS channel, there will be a 500 kHz channel in a Transition Band.

Unless the affected licensees agree otherwise prior to or during the Transition Planning Period (which is discussed in detail in Appendix B), the typical licensee who today is licensed on four interleaved 6 MHz channels and four interleaved 125 kHz I channels (totaling 24.5 MHz) will be licensed after the transition to operate on 16.5 MHz of contiguous spectrum in either the LBS or UBS, 6 MHz of spectrum in the **MBS,** 500 kHz of contiguous spectrum in the I Band and 1.5 MHz of contiguous spectrum in one of the Transitional Bands (totaling the same 24.5 MHz it was licensed for prior to the transition)," The specific frequencies to which each licensee will

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[30] Under the new handplan, licensees of MDS channels E3, E4, H1, H2 and H3 will regain the 125 kHz I channels that they had previously held, but which were reallocated from MDS to the Private Operational Fixed Service ("OFS"). ***See*** OFS ***Reallocation Order,*** 6 FCC Rcd at 6795. The I channels taken from MDS licensees were never licensed as OFS channels, presumably because they are too narrow to he usable by themselves. Returning them to their original licensees, who can accumulate them with other I channels, is the most likely method to bring these channels into use.

[31] **As** the Commission has recognized on other occasions, although 6 MHz channelization is required to comply with television standards, "neither the high power levels nor the preconfigured 6 megahertz spectrum blocks characteristic of conventional television services are necessary . . . for the flexible range of existing and contemplated wireless services." ***Upper*** 700 ***MHz First*** *R&O*, 15 FCC Rcd at 484-85 n. 43. The principal exception involves the H channel licensees. Because there are only three H channels and no known grandfathered ITFS licensees on the H channels, no channel in the MBS has been allocated to the H channels. Rather, the licensee of a current H channel will receive after the transition a 5.5 MHz wide H channel, and narrow channels in the I and Transition bands. Moreover, as is discussed in more detail *infra*, where a channel group other than an H group is shared among multiple licensees in a market, it is expected that those licensees either will split the various channels amongst themselves, agree to timeshare the channels, or otherwise reach an accommodation during the Transition Planning Period.

be assigned absent agreement during the Transition Planning Period are set forth in Attachment 1 to Appendix B.[32] However, it is anticipated that there will he an active secondary market in authorizations – those licensees that want additional spectrum in the LBS/UBS will be able to swap their spectrum in the MBS for additional LBS/UBS channels, while those that intend to focus on high-power, high-site operations will be able to swap their LBS/UBS channels for additional MBS spectrum.[33] As discussed ***infra,*** WCA, NIA and CTN are proposing certain revisions to the Commission's rules and policies applicable to assignments and transfers in order to facilitate secondary market transactions. Moreover, they are proposing that spectrum disaggregation and service area partitioning be permitted to the maximum extent possible, further enhancing the ability of licensees to tailor their service capabilities to their needs.

In crafting the new bandplan, WCA, NIA and CTN have sought to achieve two fundamental goals – to eliminate interference between one-way high-power, high-site operations and two-way cellular services by separating the different uses into different segments of the band and to facilitate the ability of individual licensees to deploy new commercial and educational services by deinterleaving the band. Each of these goals is discussed in turn.

Elimination of Interference. First, the bandplan generally segregates high-power, high-site one-way operations from two-way cellular systems. As is discussed in more detail in Section IV, post-transition operations within each segment of the new bandplan should be governed by rules specifically tailored to that segment. It is contemplated that the MBS rules largely will be based on the current 2.5 GHz band regulatory regime (although substantially streamlined) and designed primarily to protect high-power, high-site video and data operations.[34] The LBS and UBS rules generally should be based on the Part 27 licensing, operational and technical rules employed by the Wireless Telecommunications Bureau to regulate the Wireless Communications Service ("WCS") and other like services, and should be substantially more amenable to two-way cellularized systems than the current rules. However, special restrictions should be imposed at the edges of the LBS and UBS closest to the MBS to protect reception of

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[32] Although the channels in the LBS and the UBS will be 5.5 MHz wide rather than 6 MHz wide and the channels in the Transition Band will be 1.5 MHz wide, no change in the current rules affording licensees the flexibility to subchannelize and superchannelize is proposed. Therefore, even after the transition licensees can continue to utilize 6 MHz channels in the LBS, the UBS and the Transition Bands, provided that appropriate consents are achieved. What this means, for example, is that a wireless cable system that today utilizes all thirty-one 6 MHz channels in the 2.5 MHz band can continue to do so if the licensees consent, so long as it complies with the various technical and operational rules applicable to the various band segments.

[33] For example, several ITFS licensees have expressed concern that, while they are migrating from trnditional video applications to IP-based uses that are best deployed over their LBS and UBS channels, they will nonetheless be assigned a MBS channel. Others have expressed concern that they may not be receiving sufficient MBS capacity to meet Future needs. Secondary market transactions, facilitated by the new rules WCA, NIA and CTN are proposing to govern assignments and transfers of control, will assure that each type of channel moves freely to the licensee who most highly values it.

[34] As discussed in more detail below, the new rules should allow an MBS channel to continue to he used for downstream data so long as the MBS rules are met. In addition, under certain circumstances discussed below, an MBS channel may be used For two-way communications pursuant to the rules generally applicable to the LBS and the UBS.

high-power, high-site services. The I, J and **K** channel rules should put a premium on protecting **LBS,** MBS and UBS operations from interference, while allowing a variety of compatible uses on a secondary basis. In particular, the rules governing operations on the J and **K** channels must be crafted carefully to ensure protection of adjacent-channel receivers in the MBS.

This segregation of high-power, high-site one-way operations serves three purposes. It provides broadband service providers operating in the **LBS** and UBS assurance that they will be free from interference caused by cochannel high-power, high-site systems in neighboring markets. It provides a mechanism to free cellular system operators from the transaction costs imposed by a licensing system designed to assure compliance with conservative interference protection at any cost. And, it protects those ITFS receive sites that receive high-power, high-site video and data distribution services transmitted over MBS channels against interference from the consumer-installed fixed, portable and mobile subscriber units that will be deployed by two-way service operators.[35] As is discussed in more detail in Appendix B, the WCA/NIA/CTN proposal contemplates that as part of the transition to the new bandplan, every current ITFS video and data track will be migrated to appropriate transmission facilities operating on MBS channels, and every eligible ITFS receive site will receive an improved downconverter that is specifically designed to limit the reception of potentially-interfering signals from outside the MBS.[36] In other words, downstream video and data operations will be isolated in a manner that allows them to continue without interference, but without imposing substantial interference protection burdens on two-way cellular systems.[37]

Deinterleaving of the 2.5 GHz Band. Second, the new bandplan has been developed to deinterleave the channel assignments, thus maximizing the amount of contiguous spectrum each licensee can deploy and minimizing the potential for any one licensee to frustrate the deployment of services by a neighbor. **As** noted above, the rationale for the interleaved plan has been obsolete for two decades, yet that interleaving (coupled with the Commission's adjacent channel interference protection rules) severely limits the ability of each interleaved licensee to implement advanced services using its own channels, and needlessly limits the amount of contiguous

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[35] It should he noted that the interposition of the Transition Bands (the J and K channels) between the MBS on one hand and the LBS or UBS or the other is essential to assuring the required interference protection. The size of the Transition Bands was specifically selected to assure that protection, without imposing commercially unreasonable costs upon ITFS licensees and commercial system operators. First, WCA's Technical Task Group has concluded that a 6 MHz separation between MBS operations and two-way services is required in order to protect reception of MBS video signals from beat interference that would occur were two-way services permitted within 6 MHz of a closely-spaced MBS receive site.

[36] There is ample precedent for the instant proposal to reduce regulatory burdens on two-way system operations upon the installation of improved downconvelters at ITFS receive sites. In its 1999 decision in the *MDS/ITFS Two-Way Reconsideration* **Order,** the Commission eliminated certain burdensome regulation of two-way operations on licensees that provided nearby ITFS receive sites with downconvelters meeting certain technical specifications. ***See*** *MDS/ITFS Two-Way* ***Reconsideralion Order,*** 14 FCC Rcd at 12777-78.

[37] It should he noted that the Commission has imposed many of the interference protection burdens on licensees of MDS channels in the 2.1 GHz hand, as well as those in the 2.5 GHz band. ***See*** *MDS/ITFS* ***Two-way Reconsideralion Order,*** 14 FCC Rcd at 12778. Adoption of the instant proposal will allow all MDS licensees to he freed from these burdensome restrictions.

spectrum available to each licensee to 6 MHz blocks. Moreover, the existing channel plan effectively subjects any planned two-way, cellularized service offering to a veto by an adjacent channel licensee. There is no sound technical reason for preserving the current interleaving and maintaining the potential for uncooperative licensees to frustrate innovative service offerings.[38]

The proposed bandplan is one of several considered, and has been found by WCA, NIA and CTN to best balance a host of competing considerations (primarily flexibility, spectral efficiency, enhancing educational use, and cost of implementation). First and foremost, of all the possibilities considered by WCA's Technical Task Group, this bandplan best provides commercial and educational system operators with the capability of providing either Frequency Division Duplex ("FDD") or Time Division Duplex ("TDD) services. Given the desire of WCA, NIA and CTN to allow the marketplace to decide how the 2.5 GHz band should be allocated among FDD and TDD technologies, the challenge has been to weigh the competing objectives and identify the bandplan that achieves the best balance. To retain licensee flexibility, they are not proposing to restrict the bands to any particular technology – FDD and/or TDD technology can be deployed. WCA, NIA and CTN agree with the Commission's acknowledgement that "encouraging a variety of technologies . . . is an important spectrum management goal."[39] Indeed, by placing the MBS in the center of the band, the Commission can provide for the possible use of 132 MHz for symmetrical FDD services, as there will be 66 MHz in each of the LBS and the UBS.[40] Yet at the same time, the proposed bandplan is well-designed for TDD applications – most current licensees will have 16.5 MHz for TDD operations, and system operators will be able to aggregate up to 66 MHz in each of the **LBS** and the UBS for TDD services, for a total of 132 MHz. And, in markets where the MBS is made available for cellular services under the consent process discussed *infra*, all of the 190 MHz at 2.5 GHz (as well as the 2.1 GHz band) will be available for advanced MDS and ITFS services.

WCA, NIA and CTN appreciate that one of the Transition Bands (the J and K bauds) could be eliminated were the high-power, high-site services placed at either end of the band. Indeed, were they proposing that the 2.5 GHz band be used exclusively for TDD technologies, that likely would have been the bandplan proposed.[41] However, as the Commission is well-

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[38] In the *MDS/ITFS Two-Way* Report and Order, the Commission adopted policies designed to promote "channel swaps" – the mechanism licensees have utilized to deinterleave the spectrum on a contractual basis. See *MDS/ITFS Two-way* Report and Order, 13 FCC Rcd at 19167-70 (citing to "obvious benefits" of channel swapping, "particularly where two-way transmissions are envisioned."). The approach recommended here will simply expedite that process and prevent unreasonable licensees from frustrating the rapid deployment of new services.

[39] See Upper 700 *MHz First R&O*, 15 FCC Rcd at 493.

[40] Although there is no proposed formal pairing of the channels, one can readily see that the A Group can he paired with the **E** Group, the B Group with the F Group, the **C** Group with the H Group and the D Group with the G Group such that there is the same 120 MHz separation between each pair. Although it **is** not proposed that operators be required to utilize this pairing, the vendor community has indicated that it **is** highly favorable to the development of cost-effective portable and mobile FDD devices.

[41] WCA's Technical **Task** Group considered the possibility of simply deinterlcaving the band and allowing high-power operations on only the fourth of the **4** channels in a group. However, it quickly concluded that having high-power, high-site operations interspersed with a cellular network would result in intra-market interference, particularly to base-station reception of signals from low power customer devices. To avoid that interference, the

aware, FDD technology requires a separation between the highest frequency used in one direction and the lowest frequency used in the other.[42] Thus, the proposed placement of the high-power, high-site MBS in the middle of the band serves a dual purpose. It not only provides capacity for the continuation of high-power, high-site services, but it serves as the required FDD duplex separation and thus avoids the need for FDD system operators to set aside additional spectrum for the required FDD separation. If the high-power, high-site services were relegated to one end of the 2.5 GHz hand to preserve one of the 6 MHz Transition Bands, an entity looking to deploy an FDD technology would he required to set aside its own spectrum for the duplex separation – an approach that is far less spectrally efficient.[43]

However, it is proposed that when the LBS is used for FDD communications, it he restricted to subscriber-to-base traffic and that when the UBS is used for FDD communications, it be restricted to base-to-subscriber traffic. Designating the direction of communications when operating in an FDD mode will provide the vendor community with a degree of certainty as to the band usage that will translate into lower equipment costs and smaller equipment form factors (particularly for devices designed to roam between service areas). In addition, such a designation will simplify adjacent channel coordination, resulting in greater spectral efficiency as the potential is reduced for systems to be using adjacent spectrum in opposite directions. Finally, the use of the lower band for upstream traffic allows the less powerful subscriber units to take advantage of the somewhat better propagation characteristics in the LBS.

While the general philosophy of the bandplan is to isolate high-power, high-site operations from cellular systems, it certainly is possible that demand may arise for use of MBS channels in two-way, cellular operations. That demand can be accommodated in one of two ways. First, there is no reason why an MBS channel could not be used for downstream transmissions in an FDD system, so long as the licensee operates in compliance with the MBS licensing, operational and technical rules. While it is assumed that most use of the MBS will be

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proposal not only provides for a Transition Band between high-power, high-site operations and cellular operations, hut also contemplates that licensees in the **MBS** will be required to install additional filtering at the request of a LBS or UBS licensee to reduce out-of-band emissions either at the time of transition or at any lime thereafter. In addition, an approach that allows high-power, high-site operations to be interspersed with cellular systems would prevent customer devices from scanning a contiguous band for downstream signals – it would he necessary to install notch filters to filter out every fourth channel. That would result in a customer device that is too large and too expensive to be viable. And, of course, such a bandplan would not have spectrum set aside for FDD duplex separation.

[42] **In** its ***Interim Report,*** *Spectrum Study* ***of the*** *2500-2690 MHz* ***Band,*** the staff recognized that FDD technologies "require a separation of at least 30 megahertz between upstream (customer to base) and downstream (base to customer) transmissions. For FDD operation, this separation is necessary to provide sufficient isolation of upstream and downstream signals in the duplexer." ***Interim Report,*** *Spectrum Study* ***of the*** *2500-2690 MHz* ***Band,*** ET Docket No 00-232, DA 00-258 at 54 (Nov. 15, *2000)* (footnote omitted). While current technology permits a smaller separation, there is **no** doubt that a separation is required.

[43] It is also worth noting that while placing the high-power, high-site channels in the middle of the hand may force some additional spectrum to bc used for a Transition Band, that spectrum is contributed by every licensee *(500* kHz for every channel in the LBS or UBS). Thus, the contribution of spectrum to the Transition Band is a price that every licensee pays for maintaining flexibility, and it avoids requiring FDD operators to set aside larger amounts of their own spectrum to meet the duplex separation requirement inherent in FDD operations.

for downstream video and data transmissions, the proposal does not contemplate any restriction on the transmission of downstream voice in the MBS or on the number of downstream transmitters (*i.e.* cells) that an MBS licensee can deploy in its service area.[44]

Second, so long as certain requirements designed to protect high-power, high-site operations in the MBS are met, a licensee should be free to utilize an MBS channel under the same rules and policies that are applicable to the LBS and UBS (including using the channel for upstream communications and operating without site-by-site licensing). Specifically, the licensee of an MBS channel should he permitted to utilize that spectrum in accordance with the LBS and UBS rules so long as it receives written consent from: (i) every MBS licensee with a transition impact area ("TIA") (which is discussed in Appendix B to this white paper) that overlaps or is within six miles of the licensee's own Geographic Service Area ("GSA")(which is discussed in Appendix A to this white paper); and (ii) every cochannel MBS licensee with GSA center coordinates that are within 100 miles of the **GSA** center coordinates of the licensee proposing to operate under the LBS/UBS rules. This proposal allows MBS spectrum to be efficiently utilized while at the same time assuring that one of the basic purposes of the bandplan – protecting MBS operations from cochannel, adjacent channel and brute force overload interference – is not compromised. Of course, absent agreement otherwise, any licensee that chooses to utilize a MBS channel under the **LBS** and MBS rules must accept any interference it suffers from traditional downstream operations within the MBS in the same or in adjacent markets.

WCA's Technical Task Group gave long consideration to the possibility of reducing the size of the MBS on a market-by-market basis in order to increase the amount of spectrum in the LBS and UBS that could be utilized for commercial or educational cellular services. A variety of mechanisms were considered that would have, on a market-by-market basis, allocated more spectrum to the LBS and UBS in markets where the demand for MBS spectrum is lower. However, it was concluded that the benefits of a fixed, nationwide 42 MHz wide MBS far outweigh any possible benefits from ***a*** market-by-market approach.

First, the certainty of a fixed MBS translates directly into less complex, less expensive cellular system equipment, particularly customer equipment. Knowing precisely where the MBS and Transition Bands will be located allows vendors to better filter those potentially interfering signals, while keeping customer equipment size and cost at competitive levels. Second, any channels that could be reclaimed for cellular use on a market-by-market basis would, as a practical matter, not be available for use by FDD systems. The FDD vendor community has made clear to the WCA Technical Task Group that for equipment costs to be competitive, MDS/ITFS FDD systems will have to utilize a nationwide bandplan so that the duplex filter in customer devices can be standardized. As a result, any MRS channels that might he freed up in a given market likely would not he included in the range of frequencies used by FDD customer equipment. Third, market-by-market resizing of the MBS would substantially increase the cost of the downconverters that will have to he installed to receive transmissions within the MBS, as

[44] However, as is currently provided **by** Sections 21.913(b) and 74.985(b), the signals of those transmitters must be accumulated when analyzing compliance with the interference protection rules applicable to MBS operations.

special downconverters would have to be manufactured for each MBS of non-standard size. Thus, a market-by-market determination of MBS size would not only increase the initial cost of transitioning to the new bandplan, but also would place increased ongoing costs on ITFS licensees who likely will be required to purchase additional downconverters as their MBS systems expand. Fourth, while reclaimed MBS channels perhaps could be deployed for TDD in some markets, those channels would be subject to cochannel interference from high-power, high-site operations within the MBS in neighboring markets. Finally, any device (whether TDD or FDD) designed to receive the signals of channels reclaimed from the MBS in one market would be highly vulnerable to interference when roaming into other markets – because the reclaimed channel(s) would not be filtered by the device, when in a roaming market the device would receive any high-power MBS signal transmitted by the local licensee of that particular channel. The result likely will be interference that renders the customer device unusable when roaming. Not only did the vendors participating in WCA's Technical Task Group express a strong reluctance to produce equipment usable only in some markets, but operators have made clear that roaming is a critical requirement and that equipment incapable of being used nationwide is unlikely to be deployed.

Finally, as is discussed in more detail in Appendix B, the proposed bandplan has the advantage of minimizing the costs of migrating ITFS video and data operations to the MBS. Because each MBS channels uses the exact frequencies assigned to an existing MDS or ITFS channel, the costs of retuning existing transmitters or providing replacement transmitters will be extremely low.[45] Indeed, absent an agreement on channel swaps during the Transition Planning Period, four of the seven MBS licensees will be operating after the transition on a frequency within its pre-transition channel group, and two will be operating on the exact same channel.[46]

In short, the proposed bandplan lays the groundwork for the Commission to adopt technical rules that will free two-way cellular systems from highly-restrictive rules designed to protect high-power, high-site operations and will provide individual licensees greater flexibility

[45] **This point is illustrated by the following table:**

Frequency	New Channel Designation	Current Channel Designation
2572-2578	A4	c 3
2578-2584	8 4	D3
2584-2590	c 4	C4
2590-2596	D4	D4
2596-2602	E4	E1
2602-2608	F4	F1
2608-2614	G4	E2

[46] **The licensees in the C,** D, E **and F Group will all be operating within their pre-transition channel group, and the licensees** of **C4 and D4 will be operating** on **exactly the same channel as pre-transition.**

in the deployment of new service offerings. However, the bandplan is only the starting point, for the current MDS and ITFS regulatory regime must be totally overhauled if the promise of the new bandplan is to reach fruition.

III. ESTABLISHMENT OF EXCLUSIVE GEOGRAPHIC SERVICE AREAS

The current MDS/ITFS regulatory regime is an unusual hybrid system in which licenses have protected service areas -- the functional equivalent of geographic service areas -- but are nonetheless required to file complex applications and secure prior FCC approval of on a site-by-site basis before adding new facilities or making modifications to previously-authorized facilities. As is discussed above, this site-by-site licensing system is too cumbersome and the transaction costs too high to permit competitive businesses to flourish using next generation technology. While WCA, NIA and CTN believe that the current hybrid site-by-site licensing approach has continued merit for the MBS if it is streamlined, today's licensing system simply will not work for the dynamic, ever-changing low power, cellularized networks that will be deployed in the LBS, UBS, and I, J and K channel bands.[47]

That conclusion should not prove surprising to the Commission. To the contrary, the Commission has consistently recognized that "significant improvements in spectrum utilization can be realized through wide-area licensing.[48] It has found that "our experience has been that wide-area licensing (as opposed to site-by-site licensing) affords licensees substantial flexibility to respond to market demand and may result in significant improvements in spectrum utilization."[49] Indeed, the Commission recently recognized that "while a geographic area licensing scheme promotes efficient licensing and administrative ease, it also facilitates the ubiquitous use of services and provides licensees with flexibility to quickly adjust and coordinate spectrum usage, within their license areas, based on changing market conditions."[50]

The most effective solution to the problem of overly-burdensome MDS/ITFS application requirements is simply to eliminate the application requirements for services on the LBS, UBS and I channels. Just as the Commission has done with respect to a variety of other flexible use services, the Commission should afford each LBS, UBS and I channel licensee an exclusive GSA in which the licensee will be free to construct and operate facilities on its authorized

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[47] Although there is agreement that the current licensing system is not appropriate for the Transition Bands, as discussed *infra* at Section IV.A, WCA, NIA and CTN have not agreed as of yet on a system of licensing and technical rules to govern that spectrum. However, WCA, NIA and CTN ***do agree*** that whatever system of licensing ultimately is adapted for the Transition Bands must be one that ensures protection of receivers in the MBS.

[48] ***Amendments to Parts*** *1, 2, 27* ***and*** *90* ***of the Commission's Rules to License Services in the*** *216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz,* ***and*** *2385-2390 MHz Government* ***Transfer Bands,*** 17 FCC Rcd 9980,9989 (2002)["*27 MHz R&O*"].

"Amendments *to Parts 1, 2, 27* ***and*** *90* ***of the Commission's Rules to License Services in the*** *216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz* ***Government*** *Transfer Bands*, 17 FCC Rcd 2500,2514 (2002).

[50] ***Amendment of*** *Parts 2* ***and*** *25* ***of the Commission's Rules to Permit Operation of*** *NGSO FSS Systems Co-***Frequency with GSO and*** *Terrestrial Systems* ***in the Ku-Band Frequency Range,*** 17 FCC Rcd 9614, 9706 (2002).