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

In the Matter of	)	
	)	
Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands	)	WT Docket No. 03-66 RM-10586
	)	
Part 1 of the Commission's Rules - Further Competitive Bidding Procedures	)	WT Docket No. 03-67
	)	
Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and the Instructional Television Fixed Service Amendment of Parts 21 and 74 to Engage in Fixed Two-Way Transmissions	)	MM Docket No. 97-217
	)	
Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Licensing in the Multipoint Distribution Service and in the Instructional Television Fixed Service for the Gulf of Mexico	)	WT Docket No. 02-68 RM-9718

Comments of IPWireless, Inc.

Larry A. Blosser
Gray Cary Ware & Freidenrich LLP
1625 Massachusetts Avenue NW
Suite 300
Washington, D.C. 20036
(202) 238-7700

Its Attorneys

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SUMMARY

For nearly four years, IPWireless and other interested parties have actively participated in several rulemaking proceedings involving the 2500-2690 MHz band. This band, home to ITFS and MMDS, is encumbered by several decades' worth of arcane and often inconsistent regulations. The Commission's recent efforts have made substantial progress toward bringing the regulatory framework governing this band close to, if not into, the 21st Century. Yet each successive effort has seemed more like a continuation of a process of trial and error, with modest improvements interspersed with frustrating delays.

This proceeding presents the Commission with an opportunity to construct a regulatory regime that permits market participants, via private negotiations, to transition from an obsolete interleaved band plan and to rapidly and efficiently introduce innovative services. Technology exists today that will not only provide near-ubiquitous wireless broadband access, but also complement the wireless local area networks services currently using unlicensed spectrum and technologies such as IEEE 802.11 "Wi-Fi." For example, IPWireless and Possio recently introduced the "Mobile Broadband-Powered WiFi Access Point," an integrated 802.11b access point that connects with an IPWireless PCMCIA card to allow subscribers to create their own "hot spots" without the need for a fixed DSL or T1 line. When mobile broadband service is deployed, hot spots will be untethered and capable of being moved quickly and easily to any location within the mobile wireless operator's coverage area, providing "instant" Wi-Fi access at school carnivals, sporting events, trade shows and business and community council meetings.

IPWireless brings a unique perspective to the issues under consideration in this proceeding. IPWireless base station and CPE devices are currently deployed in the U.S. and in several foreign countries, providing advanced portable wireless broadband services in bands

below 4 GHz, including the MMDS/ITFS band. IPWireless holds MMDS licenses in several markets and leases ITFS spectrum in some of those same markets. IPWireless has first-hand experience in obtaining spectrum rights and commencing deployment of advanced two-way services in the MMDS/ITFS band under the current licensing scheme. IPWireless understands all too well the need to streamline and modernize the ITFS/MMDS regulations to permit the more efficient use of the MMDS/ITFS spectrum, and IPWireless shares the Commission's vision of making broadband services more widely available to all Americans, both in the educational setting and as a competitive alternative to DSL and cable modem services. IPWireless participated actively in the WCA Engineering Committee and provided input the technical proposals contained in the WCA/NIA/CTN White Paper. IPWireless supported – and continues to support – the Coalition technical proposal, provided it is adopted as a package.

In these comments, IPWireless responds to some, but far from all, of the questions posed by the Commission in the NPRM. IPWireless offers proposals for an alternative band plan and recommendations for the migration of unneeded HPO (high power operation) channels to flexible use. IPWireless also recommends that the market drive the transition from the current interleaved band plan, but that once commenced, be completed on an accelerated schedule. To prevent spectrum warehousing, stringent "use or lose" construction and service requirements should be applied to all licensees of MMDS spectrum and to commercial lessees of ITFS "excess capacity." Each of the measures recommended by IPWireless is intended to further the attainment of the Commission's goal of the rapid introduction and widespread deployment of wireless broadband service as a competitive alternative to cable and DSL.

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Comments of IPWireless, Inc.

IPWireless, Inc. ("IPWireless"), by its attorneys and pursuant to Section 1.415 of the Commission's rules, 47 C.F.R. § 1.415, hereby submits its initial comments in response to the Commission's Notice of Proposed Rulemaking ("NPRM" or "Notice") in the above-captioned proceeding.

I. INTRODUCTION AND STATEMENT OF INTEREST

IPWireless brings a unique perspective to the issues under consideration in this proceeding. IPWireless is a provider of equipment for the provision of advanced portable wireless broadband services in several bands below 4 GHz, including the MMDS/ITFS band. IPWireless also holds MMDS licenses in several markets and leases ITFS spectrum in some of

those same markets. IPWireless has first-hand experience in obtaining spectrum rights and commencing deployment of advanced two-way services in the MMDS/ITFS band under the current licensing scheme.[1] Given that experience, we understand fully the need to streamline and modernize the regulations to permit the more efficient use of the MMDS/ITFS spectrum to make broadband services more widely available to all Americans, both in the educational setting and as a competitive alternative to DSL and cable modem services for residential and small business customers. NPRM at ¶¶ 32-35.

IPWireless provided input, via its participation in the Wireless Communications Association International ("WCA") Engineering Committee, to the " White Paper" jointly submitted by the "Coalition" parties: WCA, the Catholic Television Network ("CTN") and the National ITFS Association ("NIA"). IPWireless filed comments in support of the Coalition's technical proposal, with the caveat that the Commission should bear in mind that the proposal reflected the results of a months-long process of negotiation and compromise among the interested parties. IPWireless did not agree with every decision reached through the consensus-building process, but IPWireless supported – and continues to support – the Coalition technical proposal, provided it is adopted as a package. The technical rules proposed by the Coalition, if adopted by the Commission without substantial change, will help expedite deployment of advanced wireless broadband services to all Americans via MMDS/ITFS spectrum.

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[1] At paragraph 26 of the Notice, the Commission expresses its belief that "interference issues have severely limited licensees' ability to deploy low power services." IPWireless was one of the first licensees to deploy low-power cellularized two-way data services in the MMDS/ITFS band. IPWireless has successfully deployed service in several U.S. markets. In no market has actual interference posed a major obstacle to deployment. In those cases where interference has occurred, it has been relatively easy to remedy through the application of well-understood RF engineering practices. In IPWireless' experience, it has been the current interference protection rules, rather than actual harmful interference, that have limited deployment of low-power two-way services in this band. Rule changes, including more realistic interference protection rules and the elimination of site by site licensing, are essential elements of any effort to make more efficient use of this band.

In these comments, IPWireless will address only a few of the many technical and policy issues touched upon by the Commission in the NPRM. Based upon our experience over the past several years in deploying advanced wireless broadband services in the U.S. and in other countries, IPWireless is convinced that the issues we address in these comments are pivotal. The Commission's decisions regarding the band plan, transition timetable, the build-out requirements and each of the other issues addressed in these comments will determine the types of wireless broadband services offered via the MMDS/ITFS spectrum, the pace at which those services can be introduced, and the cost of those services to consumers and businesses. IPWireless plans to review the initial and reply comments of other parties. IPWireless expects to respond, as may be appropriate, to the views of other parties, either in reply comments or in *ex parte* filings. IPWireless reiterates that, even though its views on several issues addressed in these comments may be perceived as being at odds with the Coalition's consensus position, IPWireless continues to believe that the Coalition's technical proposal, if implemented as a package, would lead to an acceptable result.

In the following sections, IPWireless responds to the Commission's requests for comments on several topics addressed in the NPRM. To facilitate Commission review, the discussion of issues is generally arranged in the order in which the issues appear in the NPRM.

II. DISCUSSION

A. CHANGES TO THE 2500-2690 MHZ BAND PLAN

1. Band Plan Alternatives (paragraphs 49-57)

Reconfiguration of the 2500-2690 MHz band is appropriate. Elimination of the interleaving of channels, originally intended to overcome the limitations of 1950's video receivers, will provide licensees and lessees with contiguous spectrum that can be more efficiently utilized to provide technologically advanced data, voice and video services. One of

the more contentious issues to be faced in this reconfiguration process is the extent to which high power uses and low power uses must be separated to mitigate adjacent channel and co-channel interference. Of the several alternatives described in paragraphs 51-57 of the NPRM, IPWireless would support adoption of either the Coalition proposal (described in paragraph 51) or the alternative described in paragraph 53. The alternatives described in paragraphs 52 and 55 should not be adopted. In response to the Commission's invitation in paragraph 54, IPWireless proposes another alternative band plan, described later in this section.

a. Coalition band plan (paragraph 51)

Like the alternative band plan proposed by IPWireless in section A. 1. d. below, the Coalition proposal designates most of the spectrum for "flexible use" and thereby avoids picking technological "winners" and "losers." The Coalition proposal affords operators considerable flexibility in the choice of technology.[2] If operators choose to deploy time division duplex ("TDD") technology, they may operate in the Lower Band Segment ("LBS"), the Upper Band Segment ("UBS") or both. The Coalition proposal also accommodates Frequency Division Duplex ("FDD") operation. The direction of FDD transmission in the UBS (base station transmit) and LBS (mobile station transmit) is specified to facilitate manufacturing and operational efficiencies consistent with the practice in traditional FDD bands. As noted by the Commission,[3] the designation of the UBS as the mobile station transmit band also serves to protect the passive band at 2690-2700 MHz. Should one operator choose to deploy a TDD

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[2] *See* Coalition White Paper, October 7, 2002 at 15-16. *See also* Letter from Paul J. Sinderbrand and Todd D. Gray to Marlene H. Dortch, February 7, 2002 ("White Paper 2nd Supplement") at footnote 3.

[3] NPRM at ¶51.

system and one of its neighbors an FDD system,[4] the interference mitigation techniques described in the White Paper 2nd Supplement can be utilized to permit deployment of otherwise "incompatible" technologies. Arguably, the Coalition band plan is not the most elegant technical solution to the refarming of the MDS/ITFS band. However, it does represent a compromise acceptable to a majority of the licensees providing input to the Coalition, including IPWireless.

b. Paragraph 52 alternative

The band segmentation plan described in paragraph 52 of the NPRM is one of several discussed in the Commission's *3G Final Report*[5]. Although this plan is similar to the Coalition band plan, the introduction of additional guard bands reduces the amount of spectrum effectively available. Assuming that each guard band is 6 MHz wide, and that the licensee of each of the existing channel groups will contribute one 6 MHz channel to each of the high power segments, the resulting spectrum available per operator per channel will be less than 5 MHz, giving the licensee of each channel group less than 15 MHz of contiguous spectrum. This is in contrast to the Coalition band plan, which would afford each channel group licensee 16.5 MHz of contiguous spectrum, and the alternative IPWireless band plan described below, which would afford each channel group licensee 17.25 MHz of contiguous spectrum. Other things being equal, in the absence of concrete plans for the effective use of guard bands, the Commission should reject this alternative in favor of another plan (either the Coalition plan or the alternative IPWireless plan) that would make more contiguous spectrum available to each licensed operator for the provision of broadband data services.

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[4] The scenario described in the text may be a hypothetical one, given that all of the low power broadband transmitters currently approved by the Commission for the MMDS/ITFS band are TDD.

[5] *Final Report: Spectrum Study of the 2500-2690 MHz Band – The Potential for Accommodating Third Generation Mobile Systems,* FCC Staff Report, March 30, 2001.

c. Paragraph 53 alternative

IPWireless views the band plan described in paragraph 53 of the NPRM, which places the High Power Operations ("HPO") at the top of the band, as one which provides a compelling alternative to the Coalition band plan, which places the HPO in the middle of the band. Advantages of this plan include: (a) reduction in the total required guard band spectrum by 6 MHz; (b) creation of a buffer between the low power operations and the aeronautical/radiolocation band above 2700 MHz; (c) support for both TDD and FDD deployments; and (d) ease of integration with band plan implementations in other countries. These advantages are explained in greater detail below.

Reduction in the total required guard band spectrum by 6 MHz. This advantage is self-explanatory, as one of the 6 MHz guard bands envisioned by the Coalition proposal is eliminated. The licensees of the group A – group H channels, which would have otherwise contributed twice as much spectrum to the guard band, would retain this spectrum.

Creation of a buffer between the low power operations and the aeronautical/ radiolocation band above 2700 MHz. Airport traffic control and weather radar is a known interferer into the MMDS band, particularly for base stations receiving uplink transmissions in the upper part of the MMDS/ITFS band.[6] The noise transmitted from the airport radar may be significantly above the noise floor for base stations operating in (especially but not only) the

[6] These stations are likely TDD base stations; under the Coalition plan and typical industry practice, FDD uplink is in the lower part of the band.

existing G and H groups, especially when the base station is located within several miles of a radar transmitter operating on the lower portion of the radar allocation.[7]

The radar would not pose as significant a problem for the subscriber terminals of a high power analog or digital system. Relatively few terminals would be expected to be operating near a radar facility and these terminals normally have antennas at a much lower height than a typical cellular base station. Professional installation of the CPE served by the high power system would be able to mitigate or reduce any detrimental effects from the radar site in many cases, or the system design could be modified to provide a higher signal strength to the CPE located in areas affected by radar. By locating the HPO channels at the top of the MDS/ITFS allocation, low power CPE providers could design their front end filtering to provide additional attenuation of the radar band, to help avoid receiver overload due to proximity to the very high power radar transmissions. All in all, separating the low power operations spectrum from the radar band by utilizing the HPO and the guard band will provide a better operating environment for the low power CPE.

Support for both TDD and FDD operation. Assuming, as the Coalition plan does, that 42 MHz is designated for High Power Operation, and that each channel group (except the H group) contributes 1 channel to the HPO and 750 KHz to the single guard band between the HPO and

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[7] There is no effective mitigation of this noise at the MMDS/ITFS base station other than to compromise the site deployment characteristics to minimize the degradation, as this noise is in-band and can only be reduced through distance or attenuation at the transmitter. The effects of this noise rise include reduced coverage radius, excessive retransmissions of data and dropped calls. Due to the unpredictable transmission characteristics of the radar, whereby power levels, transmission schedules and azimuths of operation may vary within a short period of time, the effects on the operation of the base station may vary from none to a complete loss of functionality, depending on the specifics of the situation.

the low power segment, the resulting size of the contiguous "flexible use" low power block is 24 ch. x 5.75 MHz/channel, or 138 MHz, as opposed to the White Paper plan of 132 MHz of flexible use low power spectrum divided between the LBS and UBS. The single flexible use block would be comprised of three 5.75 MHz channels each from the A (A1 – A3), B (B1 – B3), C (C1 – C3), D (D1 – D3), E (E1 – E3), F (F1 – F3), G (G1 – G3) and H (H1 – H3) groups. The HPO block would consist of seven 6 MHz channels: A4, B4, C4, D4, E4, F4 and G4.

Within the 138 MHz of flexible use spectrum, an operator would be able to deploy TDD, FDD or both, as their spectrum position allows. An operator desiring to operate an FDD system would be compelled to deploy a system with some frequency separation between the uplink band and the downlink band. There is ample spectrum (138 MHz) in the flexible use band to allow the operator some flexibility as to which channel groups are used to implement an FDD system. TDD could be deployed anywhere in the flexible use band segment, and could be accommodated within the reconfigured A-H channels, each with 17.25 MHz of contiguous spectrum.

Ease of integration with band plan implementations in other countries. Allocation of 138 MHz of contiguous spectrum under "flexible use" rules for low power 2-way systems would enhance the ability of any U.S. operators who wish to harmonize their operations with band plans that may be adopted in other countries. For example, the lower portion of the U.S. MMDS/ITFS band has been designated as the "3G" expansion band in Europe, to be available for licensing in 2008. Portions of the European 3G expansion band will be designated for TDD operation and others will be reserved for FDD systems. If the Commission adopts one of the several band plan proposals that designates most of the MMDS/ITFS band for "flexible use," an operator desiring to offer services in both the U.S. and Europe may be able to do so by reconfiguring licensed or leased spectrum it already holds or through channel swaps with other

U.S. operators. This avoids the need for the FCC to anticipate what band plan will be implemented in the 2.5 GHz band in other countries, yet retains the potential for trans-Atlantic or other international roaming services.

d. IPWireless proposal (paragraph 54)

In the event that the Commission does not accept the Coalition plan, IPWireless offers its recommendations for an alternative plan. The IPWireless plan is similar to those described in paragraphs 51 and 53 of the NPRM, and shares the advantages of those plans as described above. In addition, it has the potential to add as many as 42 MHz of additional spectrum to flexible use, some immediately and the rest at a future date.

In the IPWireless plan, as in the Coalition proposal, one channel from each of the existing four-channel groups (A4, B4, C4, D4, E4, F4 and G4) would be tentatively designated for high-power operation. These channels would be moved to the top of the band (instead of to the mid-band segment as proposed by the Coalition). Channel groups A-H would contribute equally to a 6 MHz guard band, which would lie between the initially assumed 24 MHz "HPO" segment and the flexible use band. Any guard band required between the "HPO" segment and the aeronautical band at 2700 MHz would be made up of the reclaimed narrowband response channels and equal contributions from all channel groups. The basic channel plan would be "restacked" in modified alphanumeric order (A1, A2, A3, B1…H3, A4, B4…G4). Unlike the Coalition plan, which dedicates all of the "4-series" channels to HPO, the IPWireless plan affords the licensees of each channel group an opportunity to "opt-out" of high power operation, either at the outset or at a later date. Providing an opt-out mechanism recognizes that HPO represents a relatively small

and diminishing use of the MMDS/ITFS spectrum.[8] If licensees of the A, B and D blocks in a particular market preferred LPO to HPO and opted out of high power operation at the beginning of a market transition, their channels would be moved into the flexible use category (in alphabetic order, A4, B4, D4, above H3), and the LPO/HPO guard band for that market would "move up", occupying a position between the new "D4" and the new "C4" which would still be designated for HPO. If the C group licensee opted out of HPO at a later date, the guard band would "move up" once again, but the C4 flexible use channel would occupy a spectrum position above D4 in that particular market.

The IPWireless plan presents the following advantages:

- through the market-specific negotiation and opt-out processes, sufficient spectrum is provided at the top of the band to accommodate existing HPO transmissions, on an interim basis;[9]
- the amount of spectrum dedicated to HPO does not exceed that needed to support existing educational television and other high-power uses, once any existing analog systems complete the transition to digital operation;

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[8] IPWireless is not aware of any area in the country in which there are more than four licensees operating in the HPO mode. In most areas there are only one or two systems operating in HPO mode. Making seven 6 MHz channels available for presumptive HPO use entails some inefficiency, even with an opt-out mechanism, due to the need for guard bands. However, setting a deadline for transition from HPO to flexible use can mitigate this inefficiency.

[9] The plan contemplates that spectrum "contributed" by licensees of the A-G groups for HPO will either revert to them as LPO spectrum via the opt-out mechanism or be reallocated for another use at the end of a predetermined period. If a licensee failed to opt out by the deadline to be established by the Commission, it would lose its rights to the "HPO" spectrum, which would be made available (along with any unneeded guard band spectrum) for flexible use via auction, or alternatively for unlicensed use, as the Commission may deem appropriate. The deadline would be set far enough in advance that institutions providing distance learning and other HPO applications will have had an opportunity to amortize their investment and migrate to other spectrum or to more efficient distribution technologies, such as the Internet.

e. Non-segmented alternative (paragraph 55)

IPWireless does not support this plan, which relies entirely upon acquisitions, channel trades and other voluntary market processes to effectuate any needed consolidation of channels. A de-interleaved band plan, one in which each channel group receives sufficient contiguous spectrum to permit deployment of wideband transmitters and to offer service on an economic basis, is a necessary starting point for the efficient use of the band.

2. Response Channels (paragraphs 58-59)

IPWireless supports the Coalition's proposal to return the narrowband 125 kHz response channels for MMDS use. These channels are not currently being used, and have little if any practical value as they are presently configured. This spectrum should be used as part of a guard band, either between the HPO band and the radar band at 2.7 GHz or between the HPO and LPO segments.

3. Geographic Area Licensing (paragraphs 60-97)

IPWireless supports the Coalition proposal to retain the 35-mile-radius Protected Service Area ("PSA") of each incumbent MDS and ITFS licensees, with any overlapping areas divided equally. Licensed facilities, if any, lying outside the PSA boundary as of the effective date of the rules should be permitted to continue to operate on a secondary non-interference basis pending transition to the new band plan. Any unlicensed spectrum in the 2500-2690 MHz band should be licensed on a BTA basis, to be consistent with the existing service area boundaries of geographic licensees.

4. Transition to New Band Plan (paragraphs 98-106)

If the MMDS/ITFS band is to be used to provide a competitive alternative to DSL and cable modem service, as IPWireless believes it should, a rapid completion of the transition is

essential. To this end, IPWireless does not believe that there should be an extended "voluntary" negotiation period once the transition is commenced in any geographic market. Any incumbent MMDS or ITFS licensee in a market, or a lessee of spectrum in that market, should be permitted to initiate a transition in that market.[10] Of the alternative transition plans described in the NPRM, IPWireless favors either the one described in paragraph 103 or the one outlined in paragraph 104. If the transition timetable is sufficiently short, it should not make much difference whether the transition begins with a voluntary negotiation period, or commences with a mandatory negotiation and relocation period. IPWireless believes that any transition, once commenced, should be completed within a period of two years or less. A firm and relatively short deadline, plus the possibility that an incumbent would be required to assume responsibility for its own transition costs, should provide sufficient incentive for all parties to complete the transition.

At paragraph 105, the Commission asks whether an auction could be used to restructure the bands. Auctions have been shown to be an effective means of getting spectrum quickly into the hands of those who value it highly. However, until the negotiated transition of the MMDS/ITFS band has been completed in a given market, no one will know the identity of those who will occupy particular band segments. If an auction is held before the details of a transition in a particular geographic market are finalized, there is a significant possibility that the

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[10] The decision of whether to commence a transition in any geographic market should not rest solely with licensees or lessees holding spectrum licenses or lease rights in multiple markets. In IPWireless' experience, these parties tend to postpone commencement of negotiations in small markets while they focus on their larger markets. In addition, IPWireless has been involved in cases where multiple-market spectrum holders occupying a secondary position in a given market are reluctant to engage in negotiations where the end result might be early entry by a wireless broadband provider in competition with the secondary spectrum holder's other broadband offerings, such as DSL. If all parties are required to commence and complete negotiations within a short period after a Proponent emerges in a market, the Proponent and other licensees will be able to begin providing broadband service at the earliest practicable date.

participants in that market will be required to incur additional transaction costs in restructuring the band post-transition. For this reason, IPWireless recommends that the Commission postpone auctions of ITFS/MMDS spectrum until existing licensees have had an opportunity to initiate and complete the transition process. After the transition to the new band plan has been completed, or after parties have had a reasonable opportunity (such as four years from the effective date of the Report and Order in this proceeding) to initiate and complete a transition, the Commission could initiate the process of auctioning any available spectrum in that market. Assuming the legal and policy issues associated with two-sided actions are favorably resolved, a two-sided auction would appear to be an appropriate means of restructuring spectrum rights in a market where existing participants have been unable to conclude a mutually satisfactory agreement.

Even where market participants are able to complete the transition to a new band plan via private negotiations, the Commission's auction process is likely to be useful in reassigning MMDS/ITFS spectrum initially designated for HPO use on an interim basis. If the Commission determines that continued high power operation will not be necessary for an indefinite period, a timetable for the reclamation of the HPO segment could be established in the Report and Order in this proceeding. At the end of a prescribed period, the HPO spectrum could be made available via auction to award one or more initial licenses in the flexible use category. Assuming appropriate legislative authorization, the proceeds of the spectrum auction could be used to reimburse HPO system transition costs. Alternatively, transitional HPO spectrum could be

reallocated for unlicensed use if the demand for unlicensed devices continues to grow at a rapid pace.[11]

5. ITFS Eligibility (paragraphs 107-118)

At paragraphs 107-118, the Commission asks whether it should retain or eliminate the existing restrictions on eligibility for ITFS licenses. IPWireless takes no position on this issue or on any other issue related to license eligibility or the permissible uses of spectrum, other than to note that rapid deployment of advanced wireless broadband services is more likely to occur if the market is fully open to all qualified participants. Those participants need not occupy the status of licensee, as long as the Commission's rules afford them reasonable opportunities to offer services using leased spectrum. The Commission should take steps to minimize unnecessary burdens on spectrum lessors and lessees, and to provide all operators with flexibility to offer a full complement of fixed, mobile and portable common carrier or non-common carrier services.

6. Other Eligibility Restrictions (paragraphs 119-129)

IPWireless expects that the MMDS/ITFS spectrum is most likely to be used for the provision of broadband services in competition with DSL and cable modem services. Allowing open eligibility to the incumbent local exchange carriers and cable operators may result in delays in putting the MMDS/ITFS spectrum into use as the incumbent broadband service providers seek to protect their market power. However, there may be benefits associated with allowing these companies to use MMDS/ITFS spectrum to extend services into rural and underserved areas where costs of equipment and construction make delivery of broadband service via DSL or cable

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[11] The Commission could consider returning the spectrum on a pro rata basis to the licensees of the channel groups that contributed spectrum to the HPO segment, but identifying those licensees or their successors in interest may be difficult, particularly if there are many changes in spectrum rights the interim.

impracticable. Although IPWireless is not able to provide data and analysis on this issue, we note that one possibility would be to allow open eligibility in the acquisition of spectrum licenses via auction or assignment, subject to a condition that incumbent operators divest (via geographic partitioning and assignment to an unaffiliated third party) any spectrum that covers areas where the incumbents have substantially deployed, or where they could feasibly and at relatively low cost deploy, DSL or cable broadband services.

B. TECHNICAL ISSUES

1. Signal Strength Limits, Mobile Operation, Power and Antenna Height Limits (paragraphs 131-139)

Signal strength limits. IPWireless supports adoption of the signal strength limits described in the White Paper and in the Second Supplement to the White Paper. The 47 dBμV/M limit in the Commission's rules is simple in principle, but may be difficult to implement in practice when challenged, due to ambiguities in the measurement specification. The Coalition's recommended approach is superior, in that it specifies signal measurement methodologies in sufficient detail that the potential for disagreements between operators is eliminated. Additionally, the Coalition recommendation specifies "safe harbor" antenna height limits. These are useful in providing some assurance to operators that they can avoid issues of cochannel interference if they adhere to the "safe harbor" limits.

Mobile operation. In paragraph 132, the Commission seeks comments on its proposal to issue blanket licenses for mobile operation under the geographic area licenses of MMDS and ITFS licensees. IPWireless supports the adoption of this proposal, subject to the height, power and other technical factors described herein.

Power limits – "response stations." IPWireless recommends that the Commission adopt a limit of 2 Watts EIRP per resulting channel bandwidth for customer premises equipment or

CPE, including fixed, mobile and portable devices. This limit is consistent with the corresponding limit on PCS mobile stations as set forth in Section 24.232 of the rules. Although this is substantially lower than the current MMDS limit,[12] that limit was intended to permit two-way communication over extended distances and to allow for balanced link budgets necessitating high power in both the downstream and upstream directions. A lower CPE power limit, such as that proposed by the Coalition, is consistent with the implementation of spectrum-efficient low power cellularized systems, expected to be the predominant use of the band. The 2 Watt EIRP power limit would also have the advantage of assuring compliance with the Commission's safety rules for devices operated in close proximity to the body, so that the current rules requiring warning labels and professional installation for some "response stations" could be eliminated. An additional factor to be considered is the potential for CPE-to-CPE interference. Low power CPE devices are less likely to cause interference to other nearby uncoordinated CPE. Mixing high power and low power CPE should be avoided, just as mixing high power and low power base stations is recognized as undesirable.

In paragraph 135, the Commission seeks comments on whether a maximum antenna height should be established for response stations. IPWireless does not believe that such a limit could be enforced, given an environment where response stations are permitted to operate in an uncoordinated fashion under a blanket license. A device that is typically used at ground level

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[12] The MDS/MMDS limit currently specified in Section 21.909 is an output power limit, measured at the transmitter before any associated antenna gain. This is in contrast to the PCS limit, which includes antenna gain. Under the current MDS/MMDS rules, the allowable 2 Watt output power limit corresponds to a 2000 Watt EIRP. IPWireless proposes that the 2 Watt limit be specified on a per-channel basis, as is currently done in parts 21 and 74, so that when partial or multiple channels are employed the allowable power level is adjusted as per the current main station and response station rules in parts 21 and 74. This provision allows for future technology which may employ much wider bandwidths than what is now current state of the art. The per-channel basis bandwidth would be 5.5 MHz under the Coalition plan. Other band plan options may have different basis channel bandwidths.

can be taken to the upper floors of a high-rise building, or to the top of a mountain within the system coverage area. As long as there is a reasonable limit, such as 2 Watts EIRP, the potential for CPE to cause interference is bounded and acceptable.

Power limits – base stations. If the band plan adopted by the Commission permits continued high power operation in a portion of the spectrum, existing limits for analog/high power base stations can be retained for the time being to govern operations in that portion of the band. There is no reason to devote substantial resources to refining those limits if HPO is to be phased out over time. Existing limits on HPO are acceptable. In the portion of the band reserved for low power operation, IPWireless proposes that the PCS antenna height and power limits, contained in Section 24.232, be applied. IPWireless supports the safe harbor principles described in the White Paper and the Second Supplement.

2. Emission Limits (paragraphs 140-141)

IPWireless agrees that modifications to the current emission limits, which were based on high power operation, are necessary to accommodate low power two-way operation. As previously noted, the narrowband response or "R" channels are essentially unusable. However, if they are retained, then a stringent emission mask, such as that proposed by the Coalition should be applied to minimize harmful interference to operations in adjacent channels.

Base station emission mask. As the Commission observes in the NPRM, at paragraph 140, it has not previously required a licensee to take steps to attenuate out-of-band emissions upon written request from an adjacent channel license. However, IPWireless believes that this aspect of the Coalition proposal is a reasonable solution to the adjacent channel interference problem, particularly during a transition from high power operation to low power operation. During the transition period, there will almost inevitably arise situations where incompatible technologies will be deployed on adjacent channels. In many, if not most, instances the resulting

interference will be temporary and will be eliminated as the licensees transition to compatible technologies in accordance with the new band plan. The Coalition proposal avoids requiring the installation, in all base and mobile equipment, of the costly filters that would be necessary to mitigate interference if all adjacent channel operations involved worst-case scenarios. To incorporate filters designed to worst-case specifications would unnecessarily impose costs on all licensees and consumers even though such filters were only needed on a temporary basis in a few markets. The Coalition's White Paper specifies a methodology whereby an operator can be assured of having deployable spectrum regardless of the decisions made by those operating in adjacent spectrum. The methodology also allows an operator to determine the costs he is likely to incur if additional site filtering or other measures are required to accommodate worst-case interference. IPWireless supports the White Paper concepts because we believe that the Coalition's proposed interference mitigation scheme provides a sufficiently clear and detailed regulatory framework to facilitate the resolution of interference as operators and manufacturers respond to market forces. This balanced approach is likely to result in the highest and best use of MMDS/ITFS spectrum without imposing disadvantages on any of the nascent technologies being developed for use in this band, including especially TDD technologies.

IPWireless recommends that the Commission clarify that the term "adjacent channel" when used in matters related to the emission limits is intended to encompass any and all spectrum in the band outside the channels of interest, not only those channels immediately adjacent to a particular channel. For instance, if the licensee of the proposed flexible use "A" group intends to locate a base station near an existing "C" group base station using an "incompatible" technology (as defined in the Second Supplement to the White Paper), either party could trigger the interference mitigation provisions to avoid degradation of the noise floors

of both operators. This clarification is needed to address situations where in-band noise is experienced across several channel groups, even though the out-of-channel emissions may have been attenuated substantially below the mask requirement in the immediate vicinity of the band edge as the result of the installation of an additional filter. The operators of other channel groups, in addition to the groups immediately adjacent to the channel of interest, may experience noticeable in-band noise when the base stations are in close proximity to each other and no group-specific transmit filtering is installed, and each of these operators should be entitled to the protections afforded by the Coalition's proposed "adjacent channel" interference mitigation procedures.

Mobile station emission mask. In paragraph 141, the Commission requests comments on appropriate emission masks for mobile operations. IPWireless understands that the emission masks specified in the Coalition White Paper are intended to be applied to fixed, mobile and portable operations. There is no need for more stringent emission masks to protect operations below 2500 MHz or in the 2690-2700 MHz band. There is no evidence that licensees in either of these bands currently experience harmful interference from the high power operations currently being conducted in the MMDS/ITFS band. Inasmuch as the anticipated future uses of the ITFS/MMDS band will be predominantly low power, the potential for interference with operations in the bands below 2500 MHz and above 2690 MHz should be correspondingly reduced below existing levels.

3. Technology (paragraph 142)

The Commission has requested comment on the Coalition's proposal to allow both FDD and TDD operations in the low-power band segments and to restrict the use of lower and upper band segments (when employed for FDD operations) to upstream and downstream

communications, respectively. IPWireless recommends that the Coalition's proposed separation of upstream and downstream traffic be adopted if the Commission adopts the Coalition's proposed band plan with HPO in the mid-band segment. If an alternative band plan, such as that proposed by IPWireless, is adopted, the HPO segment will be located at the top of the band, with the remainder designated for flexible use. In such a band plan, restrictions on uplink and downlink usage would not make sense, although manufacturers and operators may elect, as a matter of convention and to reduce the potential for interference, to use the higher frequencies for operation in the downstream direction. Fixed channel pairings, specific predetermined relationships between the uplink spectrum and the downlink spectrum are neither necessary nor appropriate. Designating the entire band or large portions of the band for flexible use permits incumbent licensees and lessees to deploy TDD technology in any single channel block, or to deploy FDD in any sufficiently separated pair of channel groups, or even to operate one carrier in TDD mode and another in downlink-only mode associated with the TDD carrier, as IPWireless has proposed in order to allow our technology to be deployed in historically FDD spectrum without disturbing downstream operations in the upper portion of the spectrum.[13]

4. Unlicensed "Underlay" Operation (paragraphs 142-145)

IPWireless supports the Commission's efforts to promote increased access to spectrum. As noted in the NPRM, the Commission is considering making additional spectrum in the television bands and in the 3650-3700 MHz bands available for use by unlicensed devices on an

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[13] This capability, termed "Auxiliary Downlink" by IPWireless, was recently introduced. The Auxiliary Downlink feature allows operators to operate in TDD mode in one channel in a band segment designated for TDD or FDD uplink operation and to deploy additional capacity transceivers in the downlink-only mode in spectrum designated for either TDD or FDD downlink operations. *See* the IPWireless press release at http://www.ipwireless.com/press_041502.html.

"underlay" basis. IPWireless can foresee the possibility that a portion of the spectrum within the 2500-2690 MHz band may be made available for use by unlicensed devices at a future date. Indeed, this is one possible future use of the HPO segment, if educational and other uses of that band segment are relocated to alternative technologies following an extended transition period.

Given the complexities of the upcoming transition from an interleaved band plan best suited for 1950-style high power operation to a band plan better suited to the provision of broadband Internet access over wide areas, given the untested nature of the "interference temperature" concept, and the difficult problems associated with identifying and resolving CPE-to-CPE interference in a mixed licensed/unlicensed environment,[14] IPWireless urges the Commission to refrain, for the present, from allowing unlicensed operations in the 2500-2690 MHz band.

5. Radiation from Stations that are Not Engaged in Communications (¶¶154-158)

In paragraphs 154-157, the Commission has requested comments on whether amendments to Sections 21.909(m) and 74.739(o), originally proposed by IPWireless and a group of over 100 other parties in December 1999, are still necessary or appropriate. IPWireless

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[14] Unlicensed CPE would be especially likely to cause interference to licensed systems. CPE with large system processing gains, such as IPWireless CPE, can operate at serving cell signal levels below the noise floor, so it is unlikely that any interference mitigation techniques designed to permit unlicensed operation could be even marginally successful in avoiding the use of active channels. In systems such as the IPWireless TDD system, CPE transmissions occur infrequently, yet the CPE devices are constantly monitoring the Base Station transmissions for paging and other incoming traffic. Even when IPWireless CPE is "idle," it must be able to receive transmissions from its serving cell site. A nearby unlicensed transmitter would be unable to detect the downstream transmission, as it would be below the noise floor, and would consider the frequency to be unused and available for use. It is necessary for the operators of licensed systems to have exclusive rights to use their licensed spectrum if they are to deploy wide area broadband services in an economical manner. If the operation of unlicensed devices raises the noise floor at either the base station or in the vicinity of licensed CPE, the economics of operating wide area coverage systems is compromised.

does not believe that those proposed amendments are either necessary or appropriate. In 1999, some MMDS and ITFS licensees and operators were concerned that TDD devices, relatively unknown at that time, might somehow be prone to transmitting energy during periods of reception. Their fear was that, if tens of thousands of such devices were active in a market and were within line of sight of a centrally located response station hub, the aggregate noise from those devices could impair operation of the response station hub. Events within the past two years have shown that these concerns have no factual basis. IPWireless has completed more than two years of field trials and commercial deployments of TDD equipment, and has obtained FCC equipment certification for several types of base stations and CPE devices. This experience has demonstrated that TDD devices are not a potential source of the type of interference envisioned by the MMDS/ITFS Petitioners several years ago. In addition, the system architecture of concern to the Petitioners – one in which an entire market is served by a centrally located response station hub – has proven to be unsuitable for the economical provision of two-way data services and is unlikely to be widely deployed in the future.

In paragraph 158, the Commission seeks comment on requiring that subscriber handsets (CPE) not transmit unless a base station pilot is present. IPWireless favors the adoption of such a rule as a necessary measure to avoid interference to licensed operations. CPE transmissions must be restricted to locations where the blanket-licensed devices are operating under the active control and supervision of a licensed base station.

C. STANDARDIZATION OF PRACTICES AND PROCEDURES

1. Performance Requirements (paragraphs 190-202)

IPWireless fully supports the Commission's efforts to adopt performance requirements and policies to deter spectrum warehousing, promote the rapid development and

deployment of new technologies and services, and promote service to rural areas.[15] IPWireless has been particularly disappointed with the slow pace of deployment of wireless broadband services. Spectrum warehousing has been a chronic problem in the MDS and MMDS bands since the early days of the service. Extensions of time to complete construction have been too liberally granted and licenses renewed without significant consideration of the licensees' stewardship of a scarce public resource. The next few years are critical if the Commission intends to achieve its objective of providing the majority of American consumers with a wireless broadband alternative to DSL and cable. The Commission should adopt and enforce detailed and explicit requirements that must be met by all commercial entities operating in the 2500-2690 MHz band.[16] IPWireless recommends that the Commission adopt a modified version of the MDS BTA construction requirements designed to provide licensees with an incentive to complete the build-out of wide area systems throughout their licensed areas. The construction timetable should include several milestones, and failure to achieve those milestones should result in loss of spectrum rights. If the initial licensee does not rapidly put the spectrum into productive use, the spectrum should be made available without delay to others who will use it to provide service to the public.

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[15] NPRM, ¶190.

[16] IPWireless supports the efforts of educational institutions to provide distance learning and video distribution services using licensed spectrum under the ITFS rules. ITFS licensees should be required to complete construction within a reasonable period following grant of the initial license (*e.g.* 18 months), and should be required to demonstrate that they have provided "substantial service" in order to qualify for renewal. ITFS "excess capacity" lessees, as commercial operators, should be held accountable for meeting the same performance requirements as licensees. One possible mechanism for assuring such accountability is described in the text.

IPWireless proposes the following requirements:

"Commencing on the date of initial license award, or on [the effective date of the order], whichever is later, an MMDS licensee or commercial lessee of ITFS spectrum shall:

(a) within 36 months: complete construction of, and maintain in continuous commercial service throughout the remainder of the term of its license or lease, a system capable of providing adequate service to non-affiliated customers in to one or more communities within the licensee's geographic service area;

(b) within 48 months: complete construction of, and maintain in continuous commercial service throughout the remainder of the term of its license or lease, a system capable of providing adequate service to at least one third of the population of the licensee's geographic service area;

(c) within 60 months: complete construction of, and maintain in continuous commercial service throughout the remainder of the term of its license or lease, a system capable of providing adequate service to at least two-thirds of the population of the licensee's geographic service area. "

The proposed construction requirements are intended to guard against some of the abuses that have occurred in the past. A requirement that the system remain in continuous commercial service is to prevent abuses such as certifying completion of construction based upon the temporary installation of a transmitter (such as a transmitter on wheels) that is shortly thereafter taken out of service for an extended period of time.[17] The requirement that initial construction will not be considered complete unless service is provided to non-affiliated customers is intended to guard against situations such as those where MDS video system licensees have certified construction as complete based upon the continuous transmission of television test patterns over licensed facilities, even though they have not entered into contracts with any customers.

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[17] A licensee would not be in violation of the continuous service requirement if service were interrupted by factors totally outside the licensee's control, such as fires, floods or earthquakes. Service interruptions due to factors such as the loss of electrical power, lack of availability of spear parts, etc. would be evaluated on a case-by-case basis.

Failure of a licensee to meet the construction requirements should trigger the process described in paragraph 191 of the Notice. The Commission would partition from the licensed service area any unserved area, and would reauthorize service to the unserved area pursuant to the then-existing competitive bidding procedures. IPWireless recommends that these construction requirements apply equally to MMDS BTA licensees and to incumbent MMDS licensees with protected service area authorizations.

A somewhat modified construction requirement would apply to cases where ITFS licensees lease "excess capacity" to commercial operators. Both the lessor and lessee should bear responsibility for putting that spectrum into productive use. To this end, the Commission should mandate that any lease of ITFS spectrum (or "excess capacity") require the commercial operators to meet the performance requirements described above. Any failure to satisfy these requirements would be grounds for termination of the spectrum lease. The ITFS licensee would required to demonstrate that its lessee had fully complied with the Commission's performance requirements or, alternatively, that the licensee had terminated the lease for non-performance of the lessee's regulatory obligations, in order to obtain a license renewal.

III. CONCLUSION

WHEREFORE, IPWireless respectfully requests that the Commission give serious consideration to the proposals outlined in these comments as it considers further revisions to the MMDS/ITFS band plan and the associated technical and service rules.

Respectfully submitted,

IPWireless, Inc.

By: /s/ Larry A. Blosser

Larry A. Blosser
Gray Cary Ware & Freidenrich LLP
1625 Massachusetts Avenue NW
Suite 300
Washington, D.C. 20036
(202) 238-7700

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Its Attorneys