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Before the
Federal Communications Commission
Washington, DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
Amendment of Part 2 of the Commission's	)	
Rules to Allocate Spectrum Below 3GHz for	)	
Mobile and Fixed Services to Support the	)	ET Docket No. 00-258
Introduction of New Advanced Wireless	)	
Services, including Third Generation Wireless	)	
Systems	)	

COMMENTS OF IPWIRELESS, INC.

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Dated: February 22, 2001

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SUMMARY

IPWireless has developed an Advanced Broadband Wireless technology that features initial data rates of up to 6 Mbps and simple "plug-and-play" installation. The IPWireless technology does not require an outside antenna or line-of-sight from transmission towers and complies with international standards (the UMTS/UTRA specifications developed for IMT-2000 technologies). IPWireless is ready to begin offering its Advanced Broadband Wireless technology to American consumers, bringing the next generation of broadband wireless technology to the U.S. today, at least two years ahead of the rest of the world. Because IPWireless has developed its Advanced Broadband Wireless service in the 2500-2690 MHz band (the "2.5 GHz band"), the IPWireless technology can also be used by ITFS licensees to bring the next generation of broadband interactive education to American students.

IPWireless commends the Commission on its efforts to permit the deployment of advanced wireless broadband services in the 2.5 GHz band. Indeed, had the Commission not adopted rules permitting the introduction of digital and two-way services in the band, IPWireless would likely be launching its technology elsewhere. Other entrepreneurial firms – perhaps as many as twenty – are developing a wide range of innovative technologies that can be deployed in the 2.5 GHz band. Because of the foresight of the Commission, the United States is poised to lead the world in the deployment of advanced broadband wireless services.

The fulfillment of that vision, however, assumes that the Commission promptly and emphatically reaffirms its commitment to allow advanced broadband services to be deployed in the 2.5 GHz band. IPWireless opposes the reallocation of all or any portion of the 2.5 GHz band. The 2.5 GHz band is already intensively used by incumbent ITFS and MMDS licensees to provide important educational, news and entertainment services. There can be no doubt that the

use of the band will intensify and evolve as the pending applications for two-way licenses are granted and as advanced broadband technologies become more widely available. The Commission has already identified a sufficient amount of spectrum to satisfy the projected (but uncertain) demand for comparatively narrowband 3G mobile services.

Continued regulatory uncertainty as to the status of the 2.5 GHz band threatens to stall the deployment of advanced broadband wireless services. Uncertainty makes planning and budgeting for system and equipment design, development and deployment extremely difficult, and makes it more difficult for entrepreneurial operators to raise the additional capital required for deployment of broadband wireless services in this band in the United States. Faced with the prospect of prolonged uncertainty, entrepreneurial firms and their investors are likely to pursue opportunities elsewhere. Only by issuing a clear pronouncement that the 2.5 GHz band will not be reallocated can the Commission provide the certainty necessary for the United States to lead the world in the deployment of advanced broadband wireless services.

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COMMENTS OF IPWIRELESS, INC.

IPWireless, Inc., by its attorneys, respectfully submits these comments in response to the Federal Communications Commission's January 5, 2001 Notice of Proposed Rulemaking[1] in the above-captioned docket.

INTRODUCTION

IPWireless was founded in April 1999 with a core mission to develop an Advanced Broadband Wireless technology that (1) would provide very high-speed wireless Internet (and enterprise network) access services to educational, residential and small business customers,[2] (2) would be simple to install and affordable to those customers, (3) could be provided in the United States in currently-allocated spectrum, and (4) would fully comply with international standards. In its less than two years of existence, IPWireless has accomplished its core mission.

First, the IPWireless technology is truly broadband in nature. In 2001, IPWireless will be offering wireless data services at speeds of up to six megabits per second ("Mbps") downstream

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

[2] Unlike DSL and cable modems, the IPWireless technology is not dependent upon the copper, fiber or coaxial cable deployments of the incumbent telephone and cable television companies.

and three Mbps upstream (6/3 Mbps) in a non line-of-sight environment to fixed and portable customer terminals. In 2002, IPWireless expects to offer data rates of up to 16/8 Mbps. Not only are these speeds 100 times faster than a dial-up 56-kilobit modem, but they are faster than either digital subscriber line ("DSL") or most cable modem services. In addition, both IPWireless' initial and future speeds are well in excess of the 2 Mbps minimum Third Generation ("3G") system capabilities specified for IMT-2000 systems.[3]

Second, IPWireless designed its technology for the simplest form of customer installation – plug-and-play – and took several measures to make the service affordable. Customers will be able to purchase an IPWireless start-up kit at a local electronics retailer.[4] The kit will contain the compact IPWireless "broadband modem" and a CD-ROM containing self-installing software drivers for the customer's personal computer. The customer first connects the broadband modem to an existing USB (Universal Serial Bus) or RS-232 ("serial") port on his or her personal computer and then inserts a CD-ROM. The CD-ROM automatically configures the customer's computer and then logs on to the secure (SSL) IPWireless registration server. The registration server prompts the customer to type in name, address and credit card information, which completes the configuration and registration.

The subscription process is designed to be quick and simple. Unlike most cable modem and DSL services, no visit from an installation technician is required. Nor is an external antenna

[3] Notice ¶ 17, Table 1: IMT-2000/3G System Capabilities. According to these specifications, IMT-2000/3G systems need only be capable of 2 Mbps for indoor traffic. The IPWireless technology design is based upon the view that many consumer and business users, particularly in the U.S., will not be satisfied with Internet access through the small screens of wireless phones or personal digital assistants ("PDAs"), but would instead prefer a purpose-built device capable of delivering broadband data access directly to their computers. IPWireless also believes that the comparatively low data rates and small screens of hybrid devices designed to serve as cellular phones and data terminals will not adequately support many of the advanced distance learning applications currently under development (particularly those involving video streaming and video conferencing). IPWireless expects that educators will prefer a wireless access technology permitting off-campus faculty and students to use computers, rather than cellular phones, to access the campus network at speeds comparable to on-campus Ethernet connections.

or access to in-building wiring needed. Only a short cable, supplied with the broadband modem, will be needed to connect the broadband modem to the computer.[5] IPWireless' simple "plug-and-play" installation will benefit both the customer and the wireless operator. The customer does not need to wait for an installation appointment and the absence of an external antenna eliminates the need for unsightly external wiring. The operator completely avoids the costs associated with installation "truck rolls," and the automated user self-installation also reduces the number of telephone customer support representatives required.

Third, IPWireless designed its technology to be deployed in the 2500 – 2690 Megahertz band ("2.5 GHz band") currently allocated to the Instructional Fixed Television Service ("ITFS") and the Multichannel Multipoint Distribution Service ("MMDS"). Use of the MMDS/ITFS band makes service based upon IPWireless technology affordable, and the band permits ubiquitous coverage of an area.[6] The propagation characteristics of the chosen band allow signals to penetrate foliage and the walls of most buildings, eliminating the need for outside antennas and allowing non line-of-sight service. Customers will generally be able to utilize their IPWireless modems inside buildings, because the technology is non line-of-sight. Users with laptop computers will be able to access the IPWireless service throughout the territory served by IPWireless, at home or office, restaurant or airport terminal, classroom or college residence hall. The IPWireless system architecture has been designed so that, in the 2.5

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[4] IPWireless plans to make the start-up kits widely available through major retail chains. For customers who prefer to purchase online, IPWireless plans to accept orders on its website and send startup kits to customers.

[5] Future versions of the IPWireless modem will include internal PCI cards for desktop computers and PCMCIA cards for laptop computers, thereby eliminating all wiring.

[6] IPWireless may not be able to provide a mass-market service in the U.S. with the attributes described in these comments in bands significantly above the 2.5 GHz band. Using presently available technologies, spectrum above 3 GHz would in all likelihood not support a non line-of-sight service with building penetration. The maximum distance between a base station and a subscriber also decreases at higher bands. Consequently, if the only available spectrum were between 3 GHz and 4 GHz, the number of required "cell sites" would increase by at least a factor of two, and the deployment of the technology to support a consumer-priced service might not be economically viable, even in suburban areas.

GHz band, the cell radius in a typical suburban environment will be comparable to the cell radius of existing wireless systems, including personal communication service ("PCS") systems. This allows for the use of existing cellular and PCS towers, minimizing the costs and environmental considerations associated with the construction and maintenance of new towers, thereby helping to speed deployment.

A key factor leading to IPWireless' selection of the 2.5 GHz band was the Commission's adoption of a series of orders over the past five years that have removed many of the longstanding regulatory restrictions on the use of this band, fostering the entrance of entrepreneurial companies and new technologies. As a result of the Commission's orders in the Two-Way proceeding,[7] IPWireless has been able, and expects to continue to be able, to obtain access to spectrum in this band in the secondary market through license assignments, ITFS capacity leases and channel swaps. This will permit IPWireless to bring its Advanced Broadband Wireless service rapidly to market in the U.S. without the regulatory delays inherent in spectrum reallocation and spectrum auction proceedings. If the Commission quickly decides to preserve the 2.5 GHz band for MMDS and ITFS, removing the regulatory uncertainty, IPWireless' technology could begin wide deployment in the U.S. in 2001 – to the benefit of consumers, business and education.

Fourth, IPWireless expressly designed its technology to comply with international standards. Specifically, this technology complies with UMTS/UTRA specifications, but is

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[7] *Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, FCC 98-231, MM Docket No. 97-217, Report and Order (1998); *Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, FCC 99-178, MM Docket No. 97-217, Report and Order on Reconsideration (1999); and *Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Fixed Service Licensees to Engage in Fixed Two-Way Transmissions*, FCC 00-244, MM Docket No. 97-217, Report and Order on Further Reconsideration and Further Notice of Proposed Rulemaking (rel. July 21, 2000).

implemented and optimized for broadband data. The air interface utilizes wideband-CDMA ("W-CDMA"), time-division-duplex ("TDD") technology. The implementation of standards-based technology provides IPWireless with several advantages. IPWireless is able to accommodate changing demand for upstream and downstream traffic by changing the ratio of TDD time slots assigned to upstream and downstream traffic. In addition, the use of the international UMTS standard provides a technology foundation based upon many years of research and development focused on the challenges of providing a carrier-grade service in a difficult non line-of-sight radio environment. The use of the international UMTS standard (1) helps IPWireless ensure consistently high service quality throughout the network; (2) permits IPWireless to obtain components at prices that reflect the economies of large-scale manufacturing, allowing lower cost service to customers; and (3) provides assurance that IPWireless' products will be compatible with standards-based technologies that will be deployed in other countries and allowing the technology to be upgraded as the standards evolve.

IPWireless will offer to mass market consumers a "carrier-quality" advanced wireless broadband service at prices that will be competitive with current DSL and cable modem offerings.[8] Moreover, IPWireless' Advanced Broadband Wireless service will be available to consumers and businesses beyond the reach of DSL or cable modem technologies. The ubiquitous coverage, flexibility and scalability of the IPWireless architecture make it the ideal solution for deploying broadband wireless services throughout a city and its suburbs, while at the same time being able to provide additional capacity where there are concentrations of users, such as a college campus and its adjoining neighborhoods or a large office park. The capacity, flexibility and scalability inherent in the IPWireless technology will also enable it to serve a far

[8] IPWireless contemplates that it will be a broadband service provider in the U.S. and that its technology will be deployed in the U.S. and other countries.

greater number of customers nationwide than can be served by today's satellite-based broadband systems.[9]

* * *

There is a substantial unmet demand for fixed broadband wireless access, as the Commission noted in the FCC Interim Report:

> Available evidence indicates that over the next several years the demand for affordable broadband services in the United States will far outpace the ability of incumbent local exchange carriers and cable operators to provide those services. The U.S. market for fixed wireless broadband services is expected to increase from $767 million in 1999 to $7.4 billion by 2003, with the total number of fixed wireless broadband subscribers predicted to increase from 200,000 this year to 9.4 million in 2005.[10]

The FCC Interim Report goes on to state that industry estimates show "that by the year 2005, seventy percent of the nearly 10 million estimated fixed wireless broadband subscribers will be serviced by ITFS/MDS."[11] IPWireless' own studies indicate that the demand for broadband wireless services in this band may be substantially higher, due to the advent of non line-of-sight and very high data rate technologies.

IPWireless is ready today to begin to meet that unmet demand; the technological impediments to the deployment of its Advanced Broadband Wireless technology have been resolved. IPWireless completed successful trials of its technology in 2000, and plans to begin offering commercial service in the United States in the wake of its recently-announced beta test in North Carolina. IPWireless and others who are bringing broadband technologies to market in

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[9] *See* David Ward, "Satellite Broadband Could Strain Capacity, FCC Official Warns," *Communications Daily*, Jan. 31, 2001 at 3-4.

[10] *Spectrum Study of the 2500-2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems*, Interim Report, Federal Communications Commission (November 15, 2000) ("FCC Interim Report") at 21-22 (citations omitted).

[11] FCC Interim Report at 22 n. 28.

the ITFS/MMDS band will enable the United States to lead the world in the deployment of advanced broadband wireless technologies.

DISCUSSION

I. THE COMMISSION'S FIVE-YEAR EFFORT TO INTRODUCE TWO-WAY SERVICES INTO THE MMDS/ITFS BAND HAS ENCOURAGED TECHNOLOGICAL INNOVATION AND HAS CREATED AN OPPORTUNITY FOR THE UNITED STATES TO LEAD THE WORLD IN DEPLOYMENT OF ADVANCED BROADBAND WIRELESS SERVICES.

IPWireless supports the Commission's objective of maintaining the United States' leadership position in the development and implementation of advanced wireless technologies.[12] The public policy dividends that can be realized by allowing the present use of spectrum to continue are exemplified by IPWireless' ongoing development of Advanced Broadband Wireless technology for the 2.5 GHz band. IPWireless' technology surely would not be on the verge of commercial deployment today had the FCC not established a favorable climate for innovation by opening the ITFS/MMDS band for two-way service. The Commission adopted a series of orders removing several significant regulatory obstacles to the deployment of two-way broadband services in that band, and IPWireless has responded with a substantial investment to develop its Advanced Broadband Wireless technology and to begin to offer broadband service to consumers, many of whom are beyond the reach of DSL or cable modem services.

The IPWireless technology would not have been developed in a restrictive regulatory environment, such as that found in many other nations, where spectrum is allocated for specific services and where licenses are awarded for the deployment of prescribed technologies. IPWireless has taken the UMTS/UTRA TDD air interface standard and optimized it to provide very high speed Internet (and enterprise network) access services. It has been able to do so

[12] Notice ¶ 18.

within a currently-allocated band because the Commission has adopted rules over the past five years that permit the introduction of digital and two-way services in the MMDS/ITFS band.[13] IPWireless is confident that it can deploy its Advanced Broadband Wireless service in this band without displacing or interfering with the incumbent licensees or their existing uses of the shared spectrum. IPWireless believes that, over time, the superiority of its technology will be recognized and that many of the incumbent licensees in this band (commercial operators as well as the educational, public broadcasting and religious institutions holding ITFS licenses) will deploy the IPWireless technology to deliver next generation Advanced Broadband Wireless services.

IPWireless' Advanced Broadband Wireless service is one of a number of technologies in various stages of development specifically designed for deployment in the ITFS/MMDS band. Approximately twenty companies, the majority of which are entrepreneurial firms headquartered in the United States, have apparently recognized the opportunity the Commission has created for small and entrepreneurial companies in the MMDS/ITFS band and are developing technologies of their own for deployment in this band.[14] IPWireless' development and deployment of its technology, and the similar efforts of those other companies, will help to achieve the Commission's goal of ensuring "that the United States remains at the forefront of the development of wireless technology and the provision of wireless services."[15]

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[13] The IPWireless technology is the most advanced broadband UMTS standards-based technology available in the world today. That the Commission's rules allow its deployment in the 2.5 GHz band is testimony to the success of the rule changes the Commission has made in the MMDS/ITFS band.

[14] *See* David Schober, "The Gospel According to Broadband," *Upstart,* February, 2001, viewable at: http://www.telecomclick.com/magazinearticle.asp?released=3553&magazinearticleid=29764.

[15] Notice ¶ 18.

II. THE COMMISSION SHOULD EXPEDITIOUSLY DECLARE ITS INTENTION TO CONTINUE FOSTERING DEPLOYMENT OF ADVANCED BROADBAND WIRELESS SERVICES IN THE MMDS/ITFS BAND.

The 2.5 GHz band is already intensively used by incumbent ITFS and MMDS licensees to provide important educational, news and entertainment services. At the same time, the 2.5 GHz band is increasingly being used by IPWireless and other commercial operators to deploy broadband wireless services. These emerging broadband services hold great promise. They can assist in providing a renewed growth spurt to the productivity of the U.S. economy by extending the availability of broadband services to those consumers and businesses beyond the reach of existing wired broadband infrastructure. Emerging broadband wireless services can also help to make interactive video and Internet-based instruction more broadly available in the nation's schools and colleges, by helping to provide ubiquitous, affordable broadband Internet access.[16]

There is no need to make the 2.5 GHz band available for advanced cellular/PCS services because the Commission has already identified sufficient spectrum in other bands to satisfy the projected demand for those services. The World Radio Conference 2000 ("WRC-2000") recommended that up to 160 MHz of spectrum be allocated for advanced mobile wireless services by 2010 in the most densely populated areas.[17] IPWireless does not believe that a full 160 MHz will be needed in the U.S. by 2010 for three reasons. First, a substantial portion of the forecast demand for third generation mobile services may not materialize, because many customers' needs may be satisfied by so-called "2.5G" services already being introduced by mobile operators in currently licensed spectrum.[18] Second, the improved spectrum efficiency of

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[16] Appendix A depicts a day in the life of a typical U.S. family in the near future, and illustrates just a few of the many possible applications of the IPW technology to everyday life.

[17] Notice ¶ 4 (citing Provisional Final Acts of the World Radiocommunications Conference (Istanbul, WRC-2000)).

[18] *See, e.g.,* David Pringle and Kevin J. Delaney, "Next Generation of Cellphones Becomes Murky," *Wall Street Journal* (February 21, 2001); Kirsti Hastings, "Goldman Sachs Says 3G Services May Not Catch On As

future generations of wireless technologies will wholly or partially offset the projected need for additional spectrum to support broadband mobile data.[19] Third, the U.S. will, on average, require less than the 160 MHz of spectrum identified by WRC-2000 simply because the average population density and urban concentrations in the United States are substantially lower than in many portions of Europe and Asia.[20]

Even if the Commission were to conclude that a full 160 MHz of spectrum should be made available for 3G mobile deployment in the U.S., there would be no need to disrupt and relocate the existing users in the ITFS/MMDS band. The Commission has already identified 160 MHz of new spectrum that could be used for mobile services, including IMT-2000 3G services. Some of this spectrum is in bands already specifically allocated for mobile services, and the rest is in bands proposed to be allocated for fixed and mobile services and identified for assignment by competitive bidding over the next several years. This includes 70 MHz in the 700 MHz and PCS bands, 45 MHz in the 1.7 GHz band, and 45 MHz in the 2.1 GHz band.[21]

IPWireless recommends that the Commission not disturb the ITFS/MMDS band because this band is already being developed by IPWireless and others to support advanced broadband wireless services. As the direct result of previous Commission action reducing restrictions on

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Expected," *Dow Jones International News* (December 13, 2000); Dan Briody, "Wireless Watch: Is 3G Worth the Extra Gs?," *Red Herring* (December 27, 2000).

[19] For example, cdma2000 (which represents one possible evolutionary path for mobile carriers seeking to deploy 3G services in their existing spectrum) supports the minimum mobile data rates for IMT2000 (up to 384 kbps) and, at the same time, more than doubles the operator's subscriber capacity for circuit switched voice traffic.

[20] On average, the population of the United States is only 75 persons per square mile. This is about one-ninth the population density of European nations such as Germany and the United Kingdom. Moreover, only 41 percent of the population in the United States live in urban areas, compared with 87 percent in Germany, 78 percent in Japan and 76 percent in the United Kingdom. "Poor Coverage May Hold Back Wireless," *Markets: Wireless,* August 15, 2000, viewable at: <http://cyberatlas.internet/markets/wireless/article/0,1323,10094_424451,00.html> (discussing Yankee Group study).

[21] *See* Notice at ¶¶ 37-57.

the use of the ITFS/MMDS band,[22] IPWireless and other companies have made substantial investments and major strides toward broad commercial deployment of broadband wireless services in this band. Last August, over 2250 applications for two-way authority were filed, and the Commission is expected to grant applications that are unopposed within a matter of weeks.[23] Upon grant of those licenses, IPWireless and others are poised to rapidly develop this band to deliver high-speed Internet (and enterprise network) access services to consumers and businesses, including those beyond the reach of DSL and cable modems.[24] In addition, commercial operators intend to file additional two-way applications (beyond the 2250 already pending) in future two-way filing windows. For example, WorldCom has announced plans to file additional applications for two-way authority in 100 additional markets in subsequent filing windows.[25]

Commercial operators offering broadband wireless services successfully share the use of the band with incumbent ITFS and MMDS licensees, and provide substantial financial resources which ITFS licensees may use to fulfill their educational objectives. ITFS licensees include schools and churches using the spectrum to transmit educational programming; some use analog transmission equipment and others have converted to digital systems. There are also nearly one million subscribers to "wireless cable" video services in the U.S.; most of those systems are

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[22] The Digital Declaratory Ruling (*Request for Declaratory Ruling on the Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations*, FCC 96-304, DA 95-1854 (1996)) and the series of two-way orders issued by the Commission over the last five years have significantly expanded the permitted uses of the MMDS/ITFS band.

[23] Notice ¶ 60.

[24] See FCC Interim Report, Appendix 3.3 at A-40 – A-42. IPWireless has designed and has commenced procurement of base station and subscriber equipment for operation in the 2.5 GHz band. If the Commission reallocates this band and if, as a result, IPWireless must operate in a different band, IPWireless' deployment could be delayed for as much as two years or more to allow for redesign and manufacturing. The most likely result of spectrum reallocation and relocation would be that IPWireless would not wait, but would instead seek a market outside of the United States for the initial commercial deployment of its technology. Another country – not the U.S. – would witness the first deployment of UMTS-compliant Advanced Broadband Wireless Service.

[25] FCC Interim Report, Appendix 3.3 at A-41.

located outside major metropolitan areas, and many use a combination of MMDS channels and leased ITFS spectrum.

IPWireless and other commercial operators will pay ITFS licensees many millions of dollars each year for the right to use a portion of the ITFS spectrum. These payments enable ITFS licensees to upgrade their video distribution systems and classroom video equipment, and also provide financial support for other educational activities.[26] IPWireless expects that the cooperative relationships between commercial operators will continue to evolve as broadband two-way services become more widely available. IPWireless expects that ITFS licensees will develop educational applications for the IPWireless technology, including expansion of low-cost Internet-based distance learning to classrooms, homes and offices beyond the reach of DSL and cable modems.

Continued regulatory uncertainty as to the future status of the current MMDS/ITFS band threatens to stall the deployment of advanced broadband wireless services in this band. From a business standpoint, regulatory uncertainty makes planning and budgeting for system and equipment design, development and deployment, exceedingly difficult. The more likely it appears that the 2.5 GHz band will be even partially reallocated and re-licensed, the less likely commercial operators are to continue to devote resources to these activities, and the less likely that entrepreneurial U.S. commercial operators will be able to raise additional capital for the deployment of broadband wireless services in this band.

Regulatory uncertainty also threatens to undermine the opportunity for ITFS licensees to further their educational missions by forging cooperative relationships with commercial

[26] If, as some are likely to advocate, ITFS licensees were relocated to higher frequency bands, this source of funding for education could significantly decline and perhaps disappear. Commercial operators would almost certainly be unwilling to pay the current lease rates for less desirable higher frequency spectrum – if, indeed, they would want to lease the replacement spectrum at all.

operators. In particular, regulatory uncertainty will increase commercial operators' reluctance to commit to lease portions of an ITFS licensee's spectrum, thus jeopardizing ITFS licensees' access to a substantial source of revenue they may use for the improvement of their distance learning systems and other educational programs.

Accordingly, while advanced broadband wireless services are poised to be deployed in the 2.5 GHz band today, this will only occur if the regulatory uncertainty currently overshadowing the band is removed by an explicit Commission determination that the 2.5 GHz band will not be reallocated. Only by issuing this kind of clear pronouncement will the Commission provide the level of certainty that is necessary for the pending rapid deployment of two-way advanced broadband wireless services to occur in the 2.5 GHz spectrum band.

CONCLUSION

The Commission has, through the rule changes adopted over the past five years, encouraged the development and deployment of two-way wireless data services in the MMDS/ITFS band, where the spectrum was already heavily utilized for the distribution of educational programming and commercial video services. In reliance on the Commission's actions, IPWireless and others have made substantial investments, both to acquire the right to use spectrum and to develop and to deploy advanced broadband wireless technologies in the MMDS/ITFS bands. This development and deployment should not be halted or significantly disrupted while the Commission considers how to make available any additional spectrum that may be required for deployment of 3G mobile services. Deployment of advanced wireless services in the MMDS/ITFS band has already started under developmental authorizations, and is scheduled to accelerate dramatically over the coming year as additional two-way applications are

granted and systems are deployed to address existing and future demand for advanced broadband services.

Continued regulatory uncertainty as to the fate of the incumbents in the 2.5 GHz band will only serve to slow the deployment of advanced broadband wireless services; it would effectively nullify the Commission's five-year effort to encourage the widest possible deployment of these services in the 2.5 GHz band. The longer the regulatory uncertainty persists, the more likely it will be that commercial operators scale back their planned investments in this band, or abandon the band altogether.

To avoid the chilling effect of regulatory uncertainty on the future use of this band, the Commission should, at the earliest practicable date, announce its decision to preserve the 2.5 GHz band exclusively for ITFS and MMDS licensees and thereby avoid disturbing the present evolutionary course of the current MMDS/ITFS band. By doing so and reaffirming its prior decisions in this area, the Commission would signal its continued support for the rapid deployment of advanced broadband wireless services in this band, enabling IPWireless and others to move forward rapidly to provide broadband wireless access service to customers in rural as well as urban markets.

Respectfully submitted,

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Dated: February 22, 2001

APPENDIX A

A Day in the Life of the Watson Family

An Illustration of Potential Applications of Advanced Broadband Wireless Service

High School Principal Michael Watson had been rather successful in the past getting his classrooms wired. He had been one of the first in the district to get his main building wired, but then the school population increased and space became critical with class size reduction. Within a short time he had ten portable temporary classrooms scattered around the campus, not wired into the school's existing computer network. The costs and time requirements of getting these portable classrooms wired looked prohibitive.

Then his wife Sara gave him the perfect solution. After learning that her home office was not in the DSL service area and that the cable company wasn't going to offer cable modem service anytime soon, Sara had installed a high speed wireless broadband modem in her home office computer – on her own.

At first the teachers balked when they learned he expected them to install the wireless broadband modems. They didn't have the technical skills or the time, they argued.

So he gave a demonstration at yesterday's staff meeting. He pulled the compact modem out of his pocket, plugged it into back of his laptop and loaded the self-installing CD. Within minutes he had initiated his first online wireless broadband session. The performance was all the more impressive since he was not known for his technical prowess. To their surprise all the teachers were able to install their first modem in less than 10 minutes.

Rather than waiting months for the district's purchasing department to fill his order, he simply bought the ten modems at a retail outlet. He didn't have to wait months for one of the few district technicians to come out to the school to install the modems. And sweetest of all, the school saved at least $80,000 in trenching, wiring and hardware costs – money they didn't have. And he had ten computers that didn't need network support.

Teachers found extra benefits in the first day of use. Since the modems were incredibly fast, students didn't spend the whole period just trying to download files. Also, without hard-wired network connections, the computers could be moved around to accommodate different work groups. And the teachers didn't have to worry about students finding objectionable material on the web. Because each modem was individually coded, the school is able to block content unsuitable for students without infringing on the rights of teachers and administrators.

With his broadband connection, Michael has started to change the way he works. Attaching an inexpensive, small camera to his computer, he has begun to substitute videoconferencing for trips across town. Just today he had a videoconference call with the district's budget office where they went over some budget documents. That call saved him over an hour – the time he

would have otherwise spent driving and trying to park at the administration building. The call also meant that he had been on site when the distraught parent dropped in.

As he prepares tonight's presentation to the Board of Education on the school's new literacy program, he will be doing something brand new. He's taking his laptop equipped with the wireless broadband modem so he can show the Board actual work that his students have posted on the school's web site, including a great video clip of a class presentation.

The district has also supplied the board members with wireless broadband modems for their laptops. As a result, they're getting perfect attendance at their board meetings. Tonight, for example, a Board member, felled by a cold, watched the webcast of the meeting and interacted with the other members on-line.

Ben Watson, a junior in the same high school, is sold on wireless broadband technology. His Earth Science class is one of ten, in schools across the country, participating in a national coastal water quality project sponsored by the Environmental Protection Agency. Today they ran tests and filed their reports with the EPA from the field, using the school set of laptops equipped with wireless broadband modems. Later this afternoon he joined his bi-coastal team members in the EPA chat room to discuss the findings that they had e-mailed each other. It was Ben's turn to create the charts and graphs, which he illustrated with animated graphics he found on-line. He posted the results on the project web site. Team members will be able to download the graphs to incorporate them into their respective class presentations.

Ben finds himself relying on his high-speed modem a lot this year. With applications to college due in a few months, he's been able to narrow the field for campus visits through on-line research of colleges. He's also enrolled in an on-line SAT preparation course, since his school doesn't offer this service. And last night he found a new site where he accessed sample college entrance essays from top universities around the country. He'll discuss some of these by email with his university telementor who's helping a group from his school with the college application process.

Ben's also decided to take an on-line interactive Advanced Placement course offered by the University of Vermont. (http://dmdl.uvm.edu/dln/dln_ap.html). Although Ben's school offers only four AP courses, he's found over nineteen different AP courses offered by thirty-three universities at the College Board web site. (http://www.collegeboard.org). Due to scheduling conflicts Ben found that unless he was able to take a course on-line he would need to forgo playing on the school basketball team.

He remembered how apprehensive he'd been when he took AP calculus last year, but with his high-speed modem, he could access the course syllabus and interactive tutorials with no problems. He had done quite well on the AP exams, and the on-line teacher was very responsive to his questions. In fact, that teacher used his network to track down a summer internship for Ben. Best of all, it was very convenient.

Principal Watson's daughter Laurie is a fifth grader and has been able to use wireless broadband technology to bring the rainforest into her classroom. Monday the class watched a live webcast

featuring the lead scientist in the Peruvian jungle expedition sponsored by the Jason Foundation and the National Oceanic and Atmospheric Administration.
(www.jasonproject.org/expedition/jason10/index.html)

As the students heard the jungle sounds behind him, the scientist showed them the gear the scientists will be using during the two month long research expedition. He's promised that the next time he'll be talking with them from the canopy of the trees. Laurie and her class then joined students from other schools in the expedition's chat room and e-mailed the lead scientist some questions that he will answer at the next live session.

Her team then went to the Princeton University web site to research animals that live in the Peruvian Amazon, downloaded pictures and video clips to illustrate their report and posted the report on the project web site for the other schools to review.
(http://www.ee.princeton.edu/~vivek/animals.html)

And Laurie's mother also had incorporated wireless broadband technology into her professional life as an independent contractor, for time is money for graphic artist Sara Watson. Over the last few years it has become increasingly difficult to communicate with her corporate clients and to access graphics materials on line with her slow dial up modem. She needed something faster but not too expensive. She discovered that her cable company wasn't going to offer cable modem service in their neighborhood anytime soon, and she had been calling for weeks to try to get a DSL installation date, only to find she was too far from the telephone company central office to get the service. So, she walked down to the local electronics shop and bought a 2.5 GHz wireless broadband modem. To her surprise she was in business within minutes. And she discovered that if anything goes wrong with her modem, she can simply go back to the store for an exchange.

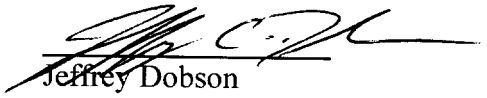
She found that the graphics, sound files and videos that used to take hours to download are now available in seconds and she can exchange large files of multi-media presentations with clients without a second thought. The fact that the technology is portable is an extra bonus. She found she can easily work from her home, office, or wherever her clients needed her. Today, finding herself running late with a client, she even surreptitiously e-mailed the family from her laptop without leaving the meeting.

* * *

These stories aren't the reality in most people's lives today. Schools are burdened with no or very slow Internet access due to the high costs of wiring classrooms and network support. Getting wired services into the average home is still an arduous process that requires skilled technicians to install and repair. However, appropriate spectrum allocation exists and new 2.5 GHz wireless broadband technology can be rapidly deployed, allowing the Watsons' stories to become the reality, beginning in the year 2001.

CERTIFICATE OF SERVICE

I, Jeffrey Dobson, do hereby certify on this 22nd day of February, 2001, that I have served a copy of the foregoing document via * messenger and U.S. Mail, postage pre-paid, to the following:



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