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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

COMMENTS OF VERIZON WIRELESS

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COMMENTS OF VERIZON WIRELESS

SUMMARY

Spectrum is the lifeblood of mobile radio services. The availability of adequate spectrum is essential if those services are to meet the rapidly growing public demand for wireless communications, including emerging Third Generation ("3G") mobile services. There can be no question that ensuring the availability of adequate spectrum will benefit the public and the United States economy. There can also be no question that current spectrum resources are inadequate, and that the United States is far behind many other

countries in making these resources available. Sound spectrum management is a fundamental responsibility of this Commission. It is critical that the Commission fulfill its responsibility by ensuring there will be sufficient spectrum for the next generation of mobile services to serve the public.

Verizon Wireless applauds the Commission's decision to help accelerate the introduction of 3G services by exploring the possible use of additional frequency bands below 3 GHz.[1] We agree with the Commission that the "demand for spectrum has increased dramatically as a result of explosive growth in wireless communications" and that "the Commission should aggressively work to make more spectrum available."[2] It is now time to follow up these words with action. We urge the Commission to allocate substantial amounts of additional spectrum for 3G mobile services and adopt a plan to ensure that spectrum is available in time to meet market needs.

The President's Council of Economic Advisors ("CEA") determined that 3G will provide significant benefits to consumers and telecommunications providers and complementary benefits to the U.S. economy.[3] It declared as an urgent objective that U.S. policymakers make adequate spectrum resources available to support the development of advanced wireless services. It determined that the allocation of sufficient

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[1] *In the Matter of Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems*, Notice of Proposed Rulemaking and Order ("NPRM"), FCC 00-455 (rel. Jan. 5, 2001).

[2] *In the Matter of Principles of Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium*, Policy Statement, 14 FCC Rcd 19868 (1999) at ¶ 2.

[3] *The Economic Impact of Third-Generation Wireless Technology*, A Report by The Council of Economic Advisors. ("CEA Report"), October 2000 at 4.

spectrum resources to support 3G development and the implementation of policies favoring investment in 3G will stimulate economic growth.

The additional spectrum made available for 3G services must be below 3 GHz, because mobile services cannot operate above that range. It is also important that 3G spectrum allocations in the United States be harmonized with allocations made around the world. Consequently, we urge the Commission to allocate spectrum for 3G use from among those bands that were identified for 3G worldwide, *i.e.,* the 1710-1850 MHz, 2110-2165 MHz, and 2500-2690 MHz bands. While these bands are all presently occupied by other services, we believe that the public interest would be best served if significant portions of these bands were made available for 3G services. The Commission should allocate spectrum for 3G services in the following bands:

- 1710-1755 MHz
- 1755-1850 MHz
- 2110-2165 MHz
- 2500-2690 MHz

Moreover, the Commission cannot facilitate the widespread deployment of 3G systems by relying on secondary market mechanisms. Consequently, the extension to incumbents of increased flexibility and other features designed to encourage secondary markets for spectrum is not an effective substitute for the allocation of additional spectrum for 3G. There is a serious need for additional spectrum to support the emerging demand for high-speed wireless data, and Internet-related services. This need cannot be remedied by creating more flexible secondary market rules.

I. ADDITIONAL SPECTRUM IS CLEARLY NEEDED TO SUPPORT THE GROWTH OF ADVANCED WIRELESS SERVICES.

A. The Convergence Of Mobile And Internet Services Is Fueling The Demand For The Next Generation Of Wireless Services.

Wireless devices currently available to consumers in the United States are designed to transmit voice and brief text messages. These devices and the systems on which they operate cannot deliver the digital multimedia and high-bandwidth Internet content at data speeds that are available over Digital Subscriber Line ("DSL"), cable modems, and certain other wireline facilities. Third Generation ("3G") wireless devices will provide high-speed mobile connections to the Internet and other communications networks, giving consumers full access to the endless content and commercial possibilities of the "information superhighway." While current devices transmit data at around 14.4 kilobits per second ("kbps"), 3G devices will transmit data at speeds between 144 kbps and 2 Megabits per second ("Mbps"), and potentially higher.

B. 3G Mobile Services Require Significant Spectrum Below 3 GHz.

While 3G technology will support a variety of broadband services, these services are extremely spectrum-intensive. As the Commission notes, the International Telecommunications Union ("ITU") has estimated that 160 MHz of additional spectrum would be needed to meet the demand for 3G services through the year 2010.[4] This is in addition to spectrum that is currently available for mobile services or has already been identified for 3G.[5]

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[4] NPRM at 4.

[5] The ITU study took into account current allocations in the Cellular Service (50 MHz), the Personal Communications Service (120 MHz), and the Specialized Mobile Radio Service (approx. 19 MHz), as well

Mobile services require spectrum in the range between 500 MHz and 3 GHz.[6] Spectrum below 500 MHz is less suited for mobile devices because of the need for larger antennas and the reduced ability of radio signals in that range to penetrate buildings. The upper limit is set by the increased blocking of radio signals at higher frequencies by trees, buildings, and other structures. The ITU recognized the importance of identifying spectrum below 3 GHz for mobile services when it identified spectrum at the 2000 World Radiocommunication Conference.[7]

C. The Ability To Deploy 3G Services In Currently Allocated Mobile Spectrum Is Limited.

As the Commission notes, the cellular band is heavily occupied by existing first generation ("1G") and second generation ("2G") mobile systems.[8] The PCS band is occupied by 2G mobile systems, though it has not yet been fully deployed. These bands will continue to be used to deliver current generation voice and narrowband data services. In addition, we expect that wireless operators will utilize whatever capacity is available in these bands to begin to deploy 3G services.

However, the likely deployment of 3G services in existing allocations does not obviate the need for additional spectrum. As previously discussed, 3G technology will permit wireless operators to offer high-speed data services and a variety of multimedia

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as spectrum identified at the1992 World Administrative Radio Conference ("WARC-92"), including 2110-2165 MHz.

[6] *See* Comments of Bell Atlantic Mobile, Inc., (filed Jan. 24, 1999), *In the Matter of 1998 Biennial Regulatory Review – Spectrum Aggregation Limits for Wireless Telecommunications Carriers"*, WT Docket No. 98-205, Notice of Proposed Rulemaking, FCC 98-308 (rel. Dec. 10, 1998).

[7] *See Provisional Final Acts of the 2000 World Radiocommunication Conference ("WRC-2000")* ("Final Acts of WRC-2000"). Resolution 223, titled "Additional frequency bands identified for IMT-2000," was initially called Resolution [COM5/24].

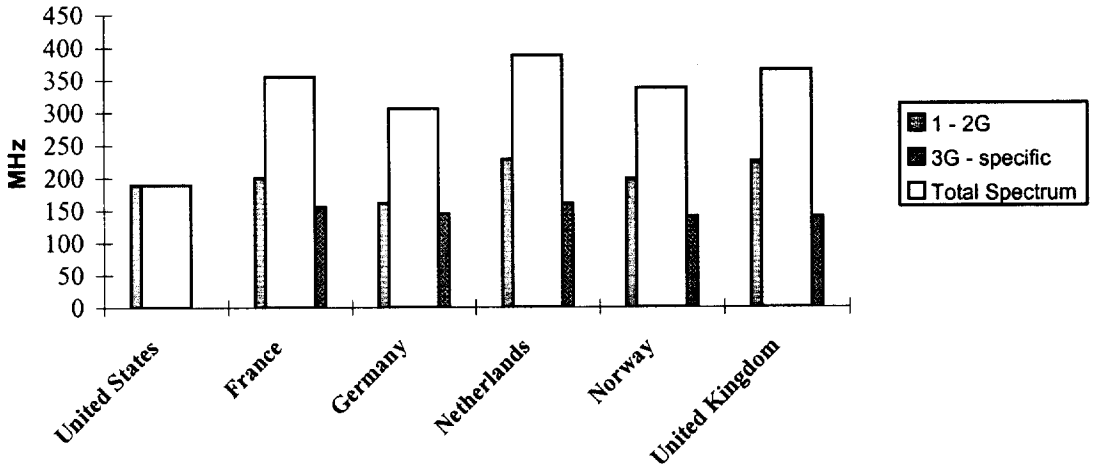
[8] NPRM at ¶ 36.

applications. These new applications, however, require more spectrum capacity than existing voice and narrowband data services. For example, with current CDMA technology, we can provide wireless data services to our customers at data rates of 14.4 kbps. Later this year, we will begin to deploy 1XRTT, a 3G technology that will allow us to provide our customers with data services at rates of 144 kbps. Thus, early 3G technology will provide a ten fold increase in data rates to our customers. However, we will only be able to serve about one-third the number of customers simultaneously at these higher rates. While 3G technologies will provide spectrum efficiency improvements, the net effect is that substantially more spectrum will be required to provide high-speed 3G services to the same number of customers. Given the projections for continued subscriber growth, the need for additional spectrum will be even greater.

D. The United States Lags Other Countries In The Allocation Of Spectrum For 3G Services.

While U.S. policymakers are reviewing the need for additional spectrum allocations to support 3G deployment in the United States, many other countries moved ahead. Those countries' governments have allocated 3G spectrum and auctioned licenses, and operators are preparing to deliver 3G services to their customers. Figure 1 illustrates how the United States has allocated far less spectrum for mobile services than various European countries.

Figure 1. Mobile Spectrum Resources
United States vs. Europe



Sources: CTIA; European Radiocommunications Office.

The United States cannot afford to wait any longer to make additional spectrum available, or it will fall behind the rest of the world in the development of advanced wireless technology. The U.S. government must make substantial amounts of additional spectrum available to satisfy the growing demand for mobile services and facilitate the next generation of wireless technology. We concur with the Cellular Telecommunications and Internet Association ("CTIA") that this action is "vital because existing mobile allocations are insufficient for development of 3G services and not in harmony with likely worldwide implementation" of 3G.[9] The Commission must, therefore, move quickly to allocate those bands identified in this rulemaking to support the development of 3G and other advanced mobile services.

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[9] *See Petition for Rule Making of the CTIA Concerning Implementation of WRC-2000; Review of Spectrum and Regulatory Requirements for IMT-2000*, RM-9920 (filed July 12, 2000) at 2; *see also Third Generation*

E. The Commission Should Adopt A Spectrum Management Plan That Supports The Long Term Growth Of 3G Services.

On October 13, 2000, President Clinton signed a memorandum declaring that the identification of spectrum to support 3G services is an urgent government responsibility.[10] He recognized the tremendous benefits that 3G would bring to U.S. consumers and the economy, and he directed the Department of Commerce to work in cooperation with the Commission to develop a spectrum management plan that would promote its development. The establishment of such a plan, and its immediate implementation, is vital to the long term success of the wireless industry. As the President directed, it is important that future spectrum allocations for 3G services be consistent with international decisions. Specifically, the spectrum bands on which U.S. policymakers should focus are those identified by the ITU, including the 2110-2165 MHz band identified at the 1992 World Administrative Radio Conference ("WARC-92") and the 1710-1850 MHz and 2500-2690 MHz bands identified at the 2000 World Radiocommunication Conference ("WRC-2000").[11]

In response to the President's directive, the Secretary of Commerce developed a plan to select spectrum for 3G services in the U.S., and the National Telecommunications and Information Administration ("NTIA") and the FCC released Interim Reports on how 3G services could be accommodated in the 1755-1850 MHz and 2500-2690 MHz bands, respectively. We commend the Commission and NTIA for their efforts, and we have worked diligently to provide whatever assistance we can. We have participated

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[10] Presidential Memorandum, *Subject: Advanced Mobile Communications/Third Generation Wireless Systems,* The White House, October 13, 2000.

[11] *See Final Acts of the 1992 World Administrative Radio Conference ("WARC-92")* ("Final Acts of WARC-92"). *See* also Final Acts of WRC-2000.

extensively with CTIA, the Personal Communications Industry Association ("PCIA"), the Telecommunications Industry Association ("TIA"), and many individual companies in technical discussions that took place as part of an ad hoc Industry Association Group ("Association Group"). These discussions included the participation of representatives from the FCC, NTIA, and DoD. A report on the deliberations of the Association Group is being filed in this proceeding by CTIA, PCIA, and TIA.

We urge the Commission to act quickly in developing its 3G spectrum management plan. As it does so, it should keep in mind the following key principles:

1. Sufficient spectrum must be made available for 3G in time to meet market needs.
2. Spectrum must be harmonized with worldwide allocations to the greatest extent possible.
3. Evolution to 3G in existing frequency allocations does not mitigate the need for additional 3G spectrum.
4. Access to 3G spectrum must be unencumbered.
5. Technological advances will not solve spectrum scarcity.

Consistent with these principles, Verizon Wireless believes it is imperative for the Commission to develop a 3G spectrum management plan that includes *all* of those bands identified in the NPRM. In addition to those bands already used for existing 1G and 2G systems, the Commission should allocate significant amounts of spectrum in the 1710-1850 MHz, 2110-2165 MHz, and 2500-2690 MHz bands.

II. THE COMMISSION SHOULD PROMPTLY ALLOCATE AND MAKE AVAILABLE THE 1710-1755 MHz AND 2110-2165 MHz BANDS.

We concur with the Commission's proposal to allocate 1710-1755 MHz, 2110-2150 MHz, and 2160-2165 MHz for 3G and other advanced wireless services. These

bands have been identified worldwide for potential 3G use because they are well suited for the provision of mobile services and can be readily deployed in many countries.[12]

A. All Federal Government Systems Should Be Relocated From The 1710-1755 MHz Band.

The 1710-1755 MHz band, currently used exclusively by the Federal Government, was reallocated by NTIA for mixed Federal and non-Federal use to satisfy the requirements of the Omnibus Budget Reconciliation Act of 1993 ("OBRA-93").[13] The band has been transferred to the Commission for assignment to commercial licensees. Under the terms of the plan developed by NTIA, most Federal systems operating in the band must be cleared by 2004. Some systems, however, are exempt from mandatory relocation. These include all fixed microwave facilities operated by Federal power agencies, certain additional fixed microwave systems that are "safety-related," and various military systems operated at seventeen Department of Defense ("DoD") sites.

These "exempt" systems must also be relocated, however, if this band is to work for 3G. The Association Group studied the use of the 1710-1755 MHz band for 3G and the potential for sharing with incumbent Federal systems.[14] It determined that co-channel sharing in the same geographic area would not be possible, and that 3G deployment would therefore be limited to areas outside of those where Federal installations exist. While these installations are not extensively deployed across the country, the requirement

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[12] The 1710-1755 MHz band was identified for IMT-2000 at WRC-2000. The 2110-2165 MHz band was identified for IMT-2000 at WARC-92.

[13] NPRM at 40.

[14] *See gen. Joint Comments of the Cellular Telecommunications & Internet Association, Telecommunications Industry Association, Personal Communications Industry Association* at Appendix, *Report of the Industry Association Group on Identification of Spectrum for 3G Services* ("Association Group Report") filed in NPRM (filed Feb. 22, 2001).

to protect these installations would adversely affect the deployment of 3G systems in some areas. For example, many of the DoD installations that are protected from interference are located near major metropolitan areas.[15] The large exclusion zones required to protect these sites would preclude the deployment of 3G in those areas. While band sharing arrangements based on geographical separation may be possible in the short term, such as in areas where 3G deployment will occur at a later date, it is essential that all Federal systems eventually be relocated to alternate spectrum.

While relocation of "exempt" Federal systems operating in the 1710-1755 MHz is not mandatory, NTIA has indicated that voluntary relocation may be possible. Based on the technical analyses described above, we believe it is not just possible, but essential, and we urge the Commission to work with NTIA to ensure that all Federal systems are cleared from the 1710-1755 MHz band. It is important that 3G services be deployed ubiquitously throughout the country, and spectrum that cannot support such deployment is far less useful to 3G implementation.

B. The Commission Should Assist NTIA In Developing Relocation And Reimbursement Policies That Advance 3G Deployment While Protecting Federal Interests.

In 1998, Congress passed the National Defense Authorization Act for Fiscal Year 1999 ("NDAA-99").[16] The purpose of this legislation was "to encourage the transfer of electromagnetic spectrum from Federal government to private use by authorizing Federal entities to accept compensation payments when they relocate or modify their frequency

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[15] NPRM at Appendix E.

[16] National Defense Authorization Act for FY2000, 106 P.L. 65, *see also* 47 U.S.C. ¶ 923(g).

use to accommodate non-Federal users of the spectrum."[17] In accordance with provisions of NDAA-99, commercial operators that are granted licenses to use reallocated Federal government spectrum must reimburse Federal agencies for the cost of relocation. Moreover, the agencies must be provided suitable replacement spectrum to accommodate the relocated systems, if necessary. These provisions apply to the relocation of Federal systems currently operating in the 1710-1755 MHz band as well as to systems operating in other bands, such as the 1755-1850 MHz band discussed in Section V below.

NDAA-99 directs NTIA and the FCC to develop procedures to implement its relocation and reimbursement provisions.[18] The Commission should work closely with NTIA to establish relocation and reimbursement policies that will advance, and not impede, the development of 3G. If these relocation and reimbursement policies do not facilitate the prompt deployment of 3G services, at costs that are reasonable, deployment of 3G services in the United States will be hindered.

NTIA has initiated a rulemaking to implement the provisions of NDAA-99. We intend to comment more fully on relocation and reimbursement policies in that rulemaking. However, we summarize here some of the guiding principles which should drive any new rules.

Use of Alternative Media or Other Commercial Services. NTIA and the affected Federal agencies should consider the use of commercially available services or alternative media (such as fiber optic cable and satellites) before relocating Federal

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[17] NTIA, U.S. Department of Commerce, *Mandatory Reimbursement Rules for Frequency Band or Geographic Relocation of Federal Spectrum-Dependent Systems*, Notice of Proposed Rulemaking ("NTIA Rulemaking") Docket No. 001206341-0341-01, (rel. Jan. 22, 2001) <http://www.ntia.doc.gov./osmhome/reports/manreimb11701.htm> (visited Feb. 22, 2001).

[18] *See* 47 U.S.C. § 923(g)(1)(E).

systems to alternate spectrum bands. Fixed communications systems may be particularly well suited to these alternatives. Given the demand for spectrum, particularly below 3 GHz, fixed systems should be accommodated using non-spectrum-based technologies to the extent practicable.

Relocation Costs. The relocation of Federal systems to other frequency bands is likely to be an expensive endeavor. To facilitate the prompt introduction of 3G services at prices that are attractive to wireless consumers, these relocation costs must be minimized. Most importantly, these costs and the timeframe in which they will be incurred must be determined with a high degree of certainty prior to any 3G auction.

Shared Use of Federal Spectrum. While NDAA-99 primarily addresses the relocation of Federal systems to accommodate private sector use, it may not be necessary to immediately relocate some systems to accommodate 3G deployment. In fact, for 3G services to be deployed economically, Federal systems should only be relocated when absolutely necessary. In some cases, it may be possible to simply modify the Federal system to accommodate 3G use. The drafters of NDAA-99 contemplated this possibility, and included provisions to compensate Federal users for both modification and relocation expenses.[19] The Commission should work with NTIA to ensure that the relocation and reimbursement rules permit shared use of Federal spectrum, where feasible. Such sharing could facilitate a smooth migration to 3G use of the band.

[19] *See* 47 U.S.C. § 923(g)(1)(B).

C. Continued Use Of 2150-2160 MHz For MDS Will Impair 3G Deployment In The 2110-2150 MHz And 2160-2165 MHz Bands.

The Commission seeks comment on the current and future use of the 2150-2160 MHz band by MDS incumbents and how this would affect the use of the 2110-2150 MHz and 2160-2165 MHz bands for 3G and other advanced wireless services.[20] Verizon Wireless has assessed the potential for adjacent channel interference into 3G systems operating in the 2110-2150 MHz band as a result of continued operation of MDS systems at 2150-2160 MHz. (See Appendix). This analysis concludes that the interference from MDS would be significant, and that continued operation of MDS in the 2150-2160 MHz band could preclude the use of the entire 2110-2150 MHz and 2160-2165 MHz bands for future 3G use.

Our analysis assumes that the MDS transmitter is operating with the maximum out-of-band emissions allowed by the FCC's rules.[21] The Commission's rules require that the maximum out-of-band emissions for an MDS transmitter be attenuated by 60 dB on any frequencies outside of the licensed MDS channel. This would result in unacceptable interference into 3G mobile receivers regardless of the amount of guard band used to separate MDS and 3G operations. At a minimum, more stringent emission limits for MDS equipment must be adopted to minimize interference into adjacent channels. (See Appendix).

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[20] NPRM at 55.

[21] *See* 47 C.F.R. § 21.908.

D. MDS Should Be Relocated From 2150-2160 MHz To Other Spectrum.

Even if the Commission were to adopt more stringent out-of-band emission limits for MDS equipment, it is likely that some significant amount of guard band would be required to reduce the potential for interference between MDS and 3G systems operating on adjacent channels in the 2.1 GHz band. While the required guard band would depend entirely on the new emission limits established by the Commission, a minimum guard band of 5 MHz is likely needed. This means that the amount of spectrum usable for 3G would be significantly reduced. The 2145-2150 MHz and 2160-2165 MHz bands could not be used, leaving only the 2110-2145 MHz band for potential 3G use.

Given the tremendous need for additional spectrum to support 3G services, the loss of this valuable spectrum should be unacceptable to the Commission. We urge the Commission to move MDS from its current allocation at 2150-2160 MHz. One option might be to move these systems to spectrum within or adjacent to the current MDS allocations at 2500-2690 MHz. At a minimum, these systems should be shifted up to the 2155-2165 MHz band. This would eliminate one guard band and increase the amount of contiguous spectrum available for 3G services. (See Appendix).

III. A SUBSTANTIAL PORTION OF THE 1755-1850 MHz FEDERAL GOVERNMENT BAND SHOULD BE REALLOCATED AND MADE AVAILABLE FOR 3G SERVICES.

The Commission seeks comment on the allocation of the 1755-1850 MHz band for 3G services if it is made available by NTIA for non-Federal use. We strongly urge that the Commission make this allocation. The DoD and NTIA have completed their preliminary assessments of the potential for accommodating 3G in the band, and a Final

Report is expected in March. While their Interim Report concludes that sharing and/or segmentation of the band may not be possible, we believe that there are means for accommodating 3G use of the band. This position is supported by the findings of the Association Group.[22] We urge the Commission to work with NTIA to make every possible effort to make this band available for 3G services.

A. Satellite Control Systems Can Be Accommodated Through Short Term System Modifications And Long Term Migration To Alternate Spectrum.

DoD operates a Satellite Control Network in the 1761-1842 MHz band that provides important tracking, telemetry, and command functions for a variety of geostationary and non-geostationary satellite systems. The band is used for uplink transmissions from a limited number of earth stations located throughout the U.S. and abroad. In its Interim Report, NTIA's preliminary assessment indicates that the satellites operated by DoD will receive significant interference from the operation of 3G systems in the band. Since near-term replacement or retuning of orbiting satellites is not possible, 3G deployment in the band would appear to be problematic.

NTIA indicates, however, that if further analysis shows that unacceptable interference would not be caused to satellite receivers by 3G deployment, some sharing might be possible using a combination of geographical and time separation.[23] The

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[22] Association Group Report at 9.

[23] NTIA, U.S. Department of Commerce, *Federal Operations in the 1755-1850 MHz Band: The Potential for Accommodating Third Generation Mobile Sy*stems, Interim Report ("NTIA Interim Report") (Nov. 15, 2000) at 30.

Association Group has performed such an analysis, and has concluded that interference from 3G systems into satellite receivers will be at acceptable levels.[24]

Unacceptable interference will result, however, into 3G receivers from operation of the SCN earth stations. This conclusion is supported by the reports of NTIA and the Association Group.[25] For earth stations located in or near urban and suburban areas, this will have an unacceptable impact on the operation of 3G systems. Since the number of SCN earth stations located in or near these areas is limited, relocation of the earth station facilities to more remote areas may represent a viable solution in the short term.

Over the longer term, 3G deployment in these remote areas is anticipated. Thus, we recommend migration of these systems out of the 1755-1850 MHz band. The 2025-2110 MHz band was identified as a suitable candidate for relocation.[26] To the extent that the 1755-1850 MHz band is reallocated for 3G services, we urge NTIA and DoD to establish a migration plan that clears the satellite systems from the band as quickly as possible.

B. Conventional Fixed Systems Should Be Relocated Out Of The Band.

The 1755-1850 MHz band is used for fixed microwave communications by various Federal agencies. In its Interim Report, NTIA determined that these fixed systems and proposed 3G systems would not be able to share the band on a co-channel basis.[27] However, NTIA does conclude that most, if not all, of the fixed systems could be relocated to alternate spectrum under its reimbursement plan. To the extent that spectrum

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[24] Association Group Report at 10.

[25] NTIA Interim Report at 30. Association Group Report at 10.

[26] Association Group Report at 16.

[27] NTIA Interim Report at 44.

used for non-Federal fixed services can be used to accommodate the relocation of these Federal systems, we urge the Commission to make such spectrum available to Federal agencies on a mixed use basis.

C. Tactical Radio Relay May Be Accommodated Through Geographic Sharing Or Use Of Alternate Spectrum.

The DoD uses Tactical Radio Relay for command and control of military forces. These systems are frequency agile, and thus may operate over the entire 1755-1850 MHz band. While DoD can operate these systems in any part of the country, the heaviest use is generally in rural areas where large-scale training operations are conducted. Consequently, it may be possible to share the band on a geographical basis, with 3G systems having access to more frequencies in urban and suburban areas and fewer frequencies in remote areas.

Tactical Radio Relay may also be operated in spectrum outside of the 1755-1850 MHz band. It may be possible, therefore, to provide DoD with access to additional spectrum in Federal or non-Federal bands to accommodate its needs. This may be particularly helpful in remote areas where DoD's spectrum needs are greatest. Consequently, we urge the Commission to consider geographical sharing arrangements in other spectrum bands as a means of providing additional spectrum resources to DoD.

D. Air Combat Training Systems Can Be Accommodated Through Band Segmentation.

Air Combat Training Systems ("ACTS") are used extensively in the 1755-1850 MHz band. These are complex systems comprised of both fixed and aeronautical mobile components. Since these systems enable communications from aircraft at high altitudes,

the potential for interference extends over a large geographic area. As a result, geographical sharing is not possible.

However, DoD has indicated that the existing ACTS systems in this band are being replaced by a new Joint Tactical Combat Telemetry System ("JTCTS").[28] Since it is possible for JTCTS to operate in relatively narrow band segments, some form of band segmentation may be possible to accommodate 3G deployment. We recommend that DoD and NTIA consider the possible acceleration of these system replacements.

IV. SOME PORTION OF THE 2500-2690 MHz BAND SHOULD BE REALLOCATED AND AUCTIONED FOR 3G SERVICES.

The Commission is studying possible use of the 2500-2690 MHz band for 3G services, and seeks comment in the NPRM on how the band could be used for this purpose. In its Interim Report, the Commission determined that co-channel sharing in this band between 3G and incumbent ITFS/MDS systems is not possible.[29] We agree with this conclusion. The simultaneous use of these frequencies by mobile and fixed services would require substantial separation distances that would impede the nationwide deployment of 3G services. The Interim Report also evaluated the possibility of accommodating 3G services in the band through band segmentation. While the Interim Report did not reach any conclusions on this point, we believe that band segmentation is

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[28] IMT-2000 Working Group, U.S. Department of Defense, *Investigation of Technical Feasibility of Accommodating the International Mobile Telecommunications (IMT) 2000 Within the 1755-1850 MH Band* ("DoD Interim Report") (Oct. 27, 2000) at E-1.

[29] Office of Engineering and Technology, Mass Media Bureau, Wireless Telecommunications Bureau, and International Bureau, Federal Communications Commission, *Spectrum Study of the 2500-2690 MHz Band, The Potential for Accommodating Third Generation Mobile Systems,* Staff Report ("FCC Interim Report") (Nov. 15, 2000) at 42.

possible. Therefore, Verizon Wireless urges the Commission to reallocate a portion of this band for 3G use.

A. The 2500-2690 MHz Band Is No Longer Used Predominantly For Instructional Purposes.

As the Commission states in its Interim Report, the 2500-2690 MHz band "is in a state of rapid evolution."[30] While it was originally allocated for the transmission of instructional programming, this band is now predominantly used for commercial purposes. In the past, when the Commission determined that spectrum was not being used predominantly for its intended purpose, it has reallocated a portion of the band to accommodate other services needing spectrum.[31] The Commission should take the same action here. In fact, the need for reallocation is far more urgent now given the tremendous need for spectrum to accommodate 3G services.

The Commission established both MDS and ITFS in 1963. At that time, it allocated 12 MHz of spectrum in the 2150-2162 MHz band to MDS to support the provision of commercial video programming services, while making available 190 MHz of spectrum in the 2500-2690 MHz band for ITFS use on a shared basis with other fixed services.[32] Frequencies in the ITFS band were used for the transmission of "instructional material to selected receiving locations in accredited public and private schools, colleges, and universities for the formal education of students."[33] Only accredited institutions or

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[30] FCC Interim Report at ii.

[31] *See In the Matter of Amendment of Parts 2, 21, 74 and 94 of the Commission's Rules and Regulations in Regard to Frequency Allocation to the ITFS, the MDS, and Private Operational Fixed Microwave Service*, Report and Order, 94 FCC 2d 1203 (1983) ("ITFS/MDS Report and Order").

[32] ITFS licensees originally shared the 2500-2690 MHz band with the Operational Fixed Service.

[33] *See* ITFS/MDS Report and Order at ¶ 9.

governmental organizations engaged in the formal education of students were permitted to hold ITFS licenses. In 1971, the Commission reduced the amount of spectrum available to ITFS to 168 MHz (channel groups A through G), but restricted this spectrum exclusively to ITFS use.[34] In 1983, the Commission again examined the lack of growth in ITFS and the need to make more spectrum available for commercial services. It reallocated 48 MHz of spectrum in the band (channel groups E and F) for MDS, further reducing to 120 MHz the amount of spectrum available to ITFS.[35]

Recognizing the limited deployment of ITFS systems and the need for additional capacity in this band to support commercial services, the Commission, in that 1983 order, also modified its rules to permit ITFS licensees to lease excess capacity to MDS operators for commercial purposes. The Commission did not at that time adopt specific limitations on how much of the licensee's excess channel capacity could be used for non-ITFS purposes. However, it stated that ITFS licensees should "utilize each of their channels substantially for legitimate ITFS use."[36] Furthermore, the Commission warned that "any wholesale abandonment of the primary purpose of the facility could jeopardize the entity's license."[37]

In 1985, the Commission adopted specific time limitations on the use of ITFS spectrum for non-instructional purposes. It determined that an ITFS licensee leasing excess capacity must preserve at least 40 hours per week on each channel for ITFS purposes, with at least 20 hours per week of the preserved time on each channel in actual

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[34] ITFS/MDS Report and Order at ¶ 11.

[35] ITFS/MDS Report and Order at ¶ 4.

[36] ITFS/MDS Report and Order at ¶ 118.

[37] ITFS/MDS Report and Order at ¶ 122.

use for ITFS programming before leasing is permitted.[38] Under these rules, the spectrum capacity licensed to ITFS would be reserved for instructional purposes only 25 percent of the time and actual use could be substantially less. The Commission later determined that ITFS licensees could lease all of their excess capacity beyond 20 hours per week so long as they reserved the right to recapture an additional 20 hours per week if needed. As a result, the spectrum capacity licensed to ITFS licensees could be used for non-instructional purposes at any time beyond the 20 hour minimum – or 88 percent of the time.

In 1991, the Commission provided MDS with even greater access to, and use of, ITFS spectrum. While affirming again that "the primary intended purpose for ITFS was to provide educational material for instructional use," the Commission modified its rules to facilitate the licensing of additional unused ITFS channels directly to MDS licensees.[39]

In 1996, following the auction of wide-area MDS licenses, the Commission modified its rules to permit the use of digital modulation by MDS and ITFS licensees.[40] In 1998, the Commission modified its rules again to facilitate the provision of two-way

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[38] *See In the Matter of Amendment of Part 74 of the Commission's Rules and Regulations in Regard to the Instructional Television Fixed Service*, Second Report and Order, 101 FCC 2d 50 (1985) ("ITFS Second Report and Order"); *see also* 47 C.F.R. 931 (e)(2) (1999).

[39] *See Amendment of Parts 21, 43, 74, 78, and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multichannel Multipoint Distribution Service, Instructional Television Fixed Service, and Cable Television Relay Service,* Second Report and Order, 6 FCC Rcd 6792 (1991) at ¶ 1.

[40] *See gen. Request for Declaratory Ruling on the use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations,* Declaratory Ruling and Order, 11 FCC Rcd. 18839 (1996).