

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of:)	
)	
International Comparison and Consumer)	GN Docket No. 09-47
Survey Requirements in the Broadband)	
Data Improvement Act)	
)	
A National Broadband Plan for Our Future)	GN Docket No. 09-51
)	
Inquiry Concerning the Deployment of)	GN Docket No. 09-137
Advanced Telecommunications Capability to)	
All Americans in a Reasonable and Timely)	
Fashion, and Possible Steps to Accelerate)	
Such Deployment Pursuant to Section 706 of)	
the Telecommunications Act of 1996, as)	
Amended by the Broadband Data)	
Improvement Act)	

**REPLY COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®
ON NBP PUBLIC NOTICE #6, SPECTRUM FOR BROADBAND**

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

Michael F. Altschul
Senior Vice President and General Counsel

Scott K. Bergmann
Assistant Vice President, Regulatory Affairs

David Redl
Director, Regulatory Affairs

CTIA-THE WIRELESS ASSOCIATION®
1400 Sixteenth Street, NW
Suite 600
Washington, DC 20036
(202) 785-0081

November 13, 2009

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I. INTRODUCTION AND SUMMARY.

CTIA – The Wireless Association® (“CTIA”)¹ submits these reply comments in response to the sixth Public Notice issued by the Federal Communications Commission (“FCC” or “Commission”) concerning the need for additional spectrum to meet the goals of the National Broadband Plan.² As these Reply Comments demonstrate, commenters overwhelmingly have

¹ CTIA-The Wireless Association® is the international organization of the wireless communications industry for both wireless carriers and manufacturers. Membership in the organization covers Commercial Mobile Radio Service (“CMRS”) providers and manufacturers, including cellular Advanced Wireless Service, 700 MHz, broadband PCS, and ESMR, as well as providers and manufacturers of wireless data services and products.

² Comment Sought on Spectrum for Broadband – NBP Public Notice #6, GN Docket Nos. 09-47, 09-51, 09-137, Public Notice, DA 09-2100 (Sep. 23, 2009) (“Public Notice”).

confirmed what CTIA detailed in its initial comments: current spectrum allocations are insufficient to meet the ever-growing demand for wireless broadband service. Moreover, evidence in the record shows that improvements in spectral efficiency alone will not be sufficient to meet demand. Based on this strong record, CTIA reiterates its call for U.S. policymakers to make significant additional allocations of licensed commercial wireless spectrum, at least 800 MHz, and to maintain its successful policies based on auctions, exclusive use, and flexible use.

The record also fully supports that the Commission's exclusive use and flexible authority licensing process for commercial wireless services has been successful in ensuring spectrum reaches its highest valued use. Indeed, as the record makes clear, this framework provides powerful economic incentives for wireless providers and is essential to their ability to deploy next generation wireless broadband services effectively and efficiently. As explained by numerous commenters in this proceeding, licensed spectrum is essential for the build-out of the large-scale mobile networks that are necessary for the wide deployment of the most advanced commercial mobile broadband services. By contrast, in an unlicensed environment, a wireless network operator cannot predict the amount or type of other traffic in the band, making it impossible for broadband service providers to control for interference or network congestion.

Without significant additional allocations of licensed commercial wireless spectrum and the right spectrum policies, U.S. consumers and businesses will find themselves unable to reap the full benefits of the mobile broadband age. CTIA urges the Commission and NTIA to leave no stone unturned in the search for large contiguous blocks of spectrum to be reallocated or repurposed for licensed commercial wireless service. Any spectrum usage below 3 GHz that has not been licensed in an exclusive, flexible fashion for commercial wireless service should be investigated for potential mobile broadband usage, including spectrum currently licensed and allocated to: (1) broadcast television; (2) fixed microwave; and (3) satellite operators. In particular, CTIA notes the significant

evidence in the record supporting a reallocation of broadcast spectrum for commercial wireless broadband use. Careful consideration of the public interest, efficiency, and innovation all suggest that such a reallocation would substantially advance the goals of Congress, the Commission, and President Obama and would substantially benefit U.S. consumers and businesses.

II. THE U.S. FACES A SPECTRUM CRISIS UNLESS SIGNIFICANT ADDITIONAL SPECTRUM IS ALLOCATED FOR LICENSED COMMERCIAL MOBILE WIRELESS BROADBAND SERVICES.

Comments in the record of this proceeding reveal the near unanimous agreement that current spectrum allocations will be insufficient to meet the explosive demand for voice and especially mobile broadband services. Parties from across the wireless ecosystem confirm expectations of increasing future usage of mobile voice and broadband services. The record is replete with evidence – whether from the International Telecommunication Union (“ITU”), equipment vendors such as Cisco Systems, Qualcomm, and Motorola, or wireless broadband providers – demonstrating that mobile data traffic has grown and is expected to continue to grow dramatically.³ Not only has the number of subscribers to wireless services increased, but those subscribers’ demand for voice minutes and data bandwidth has grown exponentially.⁴ Highlights of this record evidence include:

³ See Comments of AT&T Inc., GN Docket No. 09-51 at 2-10 (filed Oct. 23, 2009) (“AT&T Comments”); Comments of 3G Americas, GN Docket No. 09-51 at 5-6 (filed Oct. 23, 2009) (“3G Americas Comments”); Comments of Verizon Wireless GN Docket No. 09-51 at 3-5, 6-9 (filed Oct. 23, 2009) (“Verizon Wireless Comments”); Comments of T-Mobile USA, Inc., GN Docket No. 09-51 at 2 (filed Oct. 23, 2009) (“T-Mobile Comments”); Comments of Qualcomm Inc., GN Docket No. 09-51 at 1 (filed Oct. 23, 2009) (“Qualcomm Comments”), Comments of Motorola, Inc., GN Docket No. 09-51 at 3 (filed Oct. 23, 2009) (“Motorola Comments”); Consumer Electronics Association, GN Docket No. 09-51 at 2-3 (“CEA Comments”); Covad Communications Company GN Docket No. 09-51 at 3-4 (filed Oct. 23, 2009) (“Covad Comments”); *see also* Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update,” Cisco Systems, Inc. at 1-2 (Jan. 2009), *available at* http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf (“Cisco Market Forecast Report”); *see also Estimated Spectrum Bandwidth Requirements for the Future Development of IMT-2000 and IMT Advanced*, International Telecommunication Union, Report ITU-R M.2079 (2006) (“ITU Report”).

⁴ See AT&T Comments at 4.

- According to the FCC's most recent data, there were over 59 million mobile wireless high speed lines.⁵
- In addition, mobile wireless broadband growth continues to outpace every other broadband platform, with net additions between December 2007 and June 2008 greater than those of DSL and cable modem combined.⁶
- Mobile data and Internet traffic will increase 66 times between 2008 and 2013;⁷
- By 2010, "mobile broadband penetration will surpass fixed penetration globally."⁸
- The simple task of watching a YouTube video consumes 100 times the bandwidth of a voice call.
- The mobile data traffic footprint of a single mobile subscriber in 2015 could very well be 450 times what it was in 2005.⁹

These projections are consistent with mobile broadband providers' experiences to date. For example, AT&T noted that its wireless data traffic has increased nearly 5,000 percent in the past 12 quarters and other carriers have likewise reported dramatic increases.¹⁰ Similarly, since T-Mobile

⁵ *High-Speed Services for Internet Access: Status as of June 30, 2008*, Federal Communications Commission, at Tbl. 1 (July 2009) ("June 2008 FCC High-Speed Services Report").

⁶ *June 2008 FCC High-Speed Services Report* at Tbl. 1.

⁷ See Verizon Wireless Comments at 3-4; Cisco Market Forecast Report at 1.

⁸ 3G Americas Comments at 3 (quoting Chetan Sharma Consulting, *Managing Growth and Profits in the Yottabyte Era* 16 (2009), <http://www.chetansharma.com/yottabyteera.htm>).

⁹ *3GPP Technology Approaches For Maximizing Fragmented Spectrum Allocations*, 3G Americas at 18 (July 2009) ("2009 3G Americas Spectrum Paper").

¹⁰ AT&T Comments at 7 (citing *Ex Parte* Letter from Kathleen O'Brien Ham, T-Mobile USA, to Marlene H. Dortch, Federal Communications Commission, GN Docket No. 09-51, WT Docket No. 06-150, PS Docket No. 06-229, WT Docket No. 05-265, WT Docket No. 00-193, WC Docket No. 05-25, at 9 (filed Aug. 6, 2009) ("T-Mobile G1 customers use 50 times the data of the average T-Mobile customer"); see also *AT&T CMRS Innovation Comments*, Faulhaber & Faber Decl. at 12-13 ("*Faulhaber & Faber Declaration*").

began offering its G1™ smartphone, customers of that device use, on average, 50 times the data of the average T-Mobile customer.¹¹

Moreover, evidence on the record shows that improvements in efficiency alone will not be sufficient to meet demand. Various commenters counseled that additional spectrum will be needed despite unmatched improvements in spectral efficiency by the wireless industry.¹² While “domestic network operators are empirically some of the most spectrum efficient licensees in the world,”¹³ and they have “both the need and the incentive to . . . use spectrum as efficiently as possible . . . spectrum usage is growing at such a rate that, without additional large blocks of spectrum, the industry will not be able to keep up.”¹⁴ And as Motorola noted, even technology and deployment methods, which “will undoubtedly continue to advance and allow even greater efficiency to be squeezed from the limited spectrum resource . . . will not keep pace with the growing capacity requirements.”¹⁵

The record also shows broad support for CTIA’s proposal that an additional 800 MHz of spectrum below 3 GHz be made available for commercial mobile licensed services based on data from the ITU Report and Rysavy Research.¹⁶ This proposal is premised on the rapid

¹¹ T-Mobile Comments at 6-7.

¹² See Motorola Comments at 7.; Qualcomm Comments at 35; T-Mobile Comments at 11; Verizon Wireless Comments at 5 (“Current spectrum allocations will be exhausted despite continued efforts by wireless carriers to make more efficient and intensive use of their licensed spectrum.”).

¹³ AT&T Comments at 3.

¹⁴ T-Mobile Comments at 11; *see also* AT&T Comments at 3.

¹⁵ Motorola Comments at 7.

¹⁶ See *Ex Parte* Letter from Christopher Guttman-McCabe, V.P., Regulatory Affairs, CTIA – The Wireless Ass’n, to Chairman Julius Genachowski, and Commissioners Copps, McDowell, Clyburn, and Baker, Federal Communications Commission, GN Docket No. 09-51 (filed Sept. 29, 2009) (“CTIA Proposal”); *see also* Comments of MetroPCS Communications, Inc., GN Docket No.

“pace of technological development and consumer adoption of data services.”¹⁷ An additional 800 MHz of spectrum is “necessary to avoid stifling future broadband growth for wireless markets such as the United States.”¹⁸ MetroPCS agreed that this proposal is the proper order of magnitude if the Commission hopes to promote and maintain robust retail competition.¹⁹

CTIA reiterates its request to the FCC to identify and reallocate an additional 800 MHz of spectrum below 3 GHz for licensed commercial wireless services. Action by the Commission to provide an allocation of this magnitude is critical because, as CEA has stated: “Urgent action is required now in order to keep up with spiraling consumer demand and to ensure that our nation’s broadband platforms are sufficiently robust to allow for the development of increasingly bandwidth-intensive applications, content and services in the years ahead.”²⁰

III. LOCATING THE RIGHT SPECTRUM AND ADOPTING THE RIGHT SPECTRUM POLICIES ARE ESSENTIAL TO THE MOBILE BROADBAND FUTURE.

The comments in the record make clear that the task for U.S. policymakers is not simply to allocate *any* spectrum but is to allocate *the right* spectrum which will best facilitate mobile wireless broadband services and to adopt *the right* spectrum policies which will maximize investment, innovation and efficiency in the deployment of these networks.

As described in this section, the Commission must act quickly to locate large blocks of spectrum with the appropriate propagation characteristics for mobile broadband, whether it is

09-51 at 5-6 (filed Oct. 23, 2009)(“MetroPCS Comments”); Motorola Comments at 3-4; T-Mobile Comments at 12-13; AT&T Comments at 2; Reply Comments of Verizon Wireless, GN Docket No. 09-51 at 48 (filed Nov. 5, 2009) (“Verizon Wireless Innovation Reply Comments”).

¹⁷ T-Mobile Comments at 12.

¹⁸ AT&T Comments at 3.

¹⁹ MetroPCS Comments at 6

²⁰ CEA Comments at 3.

currently allocated to Federal or non-Federal use. Adopting the right spectrum policies is also essential to ensuring the success of mobile broadband in the future. Not surprisingly, commenters overwhelmingly urged the Commission to maintain its current exclusive-use, flexible licensing model that allows the market and consumers to determine the highest and best use of spectrum, rather than regulators.

A. Maintaining Successful Spectrum Policies is Critical.

Commenters strongly emphasized that the Commission should maintain its successful spectrum policies, which long have been based on exclusivity, flexible use and the auction process. These policies have been successful in the past and will be critical to the future success of mobile broadband.²¹ Likewise, commenters overwhelmingly rejected the idea that government should determine the best use of spectrum and urged reliance on the market to determine the highest and best use of spectrum. As explained by PCS Partners, “the Commission’s market-based spectrum policies, including spectrum auctions and flexible use rules, promote innovation and investment and thereby lead to the highest and best commercial use of spectrum.”²² AT&T noted that a “keystone of prior FCC policy has been the creation of exclusive use rights for mobile licensees,” which “coupled with flexible use policies, has resulted in U.S. carriers leading the world with respect to

²¹ See AT&T Comments at 21 (“Key among those policies has been distribution of spectrum by open auctions with broad participation, licensing spectrum on an exclusive use basis with technical regulatory flexibility, and measures to promote the development of a functional and effective secondary market.”); Comments of Clearwire Corp., GN Docket No. 09-51 at 5 (filed Oct. 23, 2009) (“Clearwire Comments”); Qualcomm Comments at 27-30; Comments of PCS Partners, L.P., GN Docket No. 09-51 at 2 (filed Oct. 23, 2009) (“PCS Partners Comments”); T-Mobile Comments at 17.

²² PCS Partners Comments at 2.

investment and spectrum efficiency.”²³ Such policies have freed the wireless industry to innovate and compete to the benefit of U.S. subscribers.²⁴

Furthermore, as the record shows, the Commission should specifically reject proposals for third party access to licensed spectrum outside permissive use and the secondary markets framework.²⁵ Such proposals would convert exclusive use spectrum to non-exclusive, shared spectrum and undermine the very purpose of the instant proceeding. As noted by AT&T, Verizon Wireless, Clearwire and others, exclusive use provides the strongest incentives for the investment and innovation needed to best utilize spectrum for broadband.²⁶ The FCC’s “exclusive use licensing model has provided carriers with a powerful incentive to upgrade technology to increase the quality of their services and to expand the number of users and devices that communicate on that spectrum,”²⁷ and “without certainty attached to licensed spectrum, network providers may not invest if forced to share access.”²⁸

The FCC should also reject requests, such as those from the Utilities Telecom Council, for exclusive allocations for new Smart Grid or other specific purpose networks. It would be inefficient

²³ AT&T Comments at 23.

²⁴ *Id.*

²⁵ See Clearwire Comments at 5; AT&T Comments at 30; see also Verizon Wireless Innovation Reply Comments at 20 (citing support from Sprint Nextel, CTIA, Clearwire and Qualcomm for the proposition that reducing interference protection for Commission licensees through overlays or underlays may limit a spectrum-constrained network provider’s ability to manage its spectrum to the detriment of its customers, will unquestionably cause interference and degrade service, would create new impediments to achieving more reliable, higher throughput services, and would make deployment more technically challenging and more costly.).

²⁶ See, e.g., AT&T Comments at 24, 30-31; Clearwire Comments at 5; MetroPCS Comments at 10; Qualcomm Comments at 34-36; Verizon Wireless Comments at 18.

²⁷ Verizon Wireless Comments at 18.

²⁸ Clearwire Comments at 5.

to set aside dedicated spectrum for the creation of specific purpose networks when existing and expanding commercial wireless networks can readily satisfy those needs.²⁹ Indeed, as AT&T explained, the Commission’s flexible use policies have allowed carriers and manufacturers to develop innovations in “telehealth services, energy grid services, integrated navigation services, netbooks, e-books, and other innovative machine-to-machine and similar offerings” that would have been unfeasible to accomplish through use specific spectrum service rules.³⁰ As noted by Sprint Nextel, “specialized spectrum allocations are not the answer. Doling out spectrum to discrete industry segments is neither efficient nor effective. Preventing the industry that places the highest economic value on a resource from acquiring it by definition imposes opportunity costs on the American economy.”³¹

Finally, policymakers should continue to improve the implementation of the Commercial Spectrum Enhancement Act (“CSEA”) by providing information, transparency and coordination between Federal and private entities.³² While still in its infancy, the framework and process set forth in the CSEA for relocation of Federal users from reallocated spectrum appears to be working in a promising manner. But the FCC and NTIA should continue to work to improve processes with more transparent rules and efficient procedural efforts.³³ For example, CTIA supports efforts in Congress, such as the Spectrum Relocation Improvement Act of 2009, sponsored by Reps. Jay

²⁹ See AT&T Comments at 23-24; Comments of Sprint Nextel, GN Docket No. 09-51 at 17-19 (filed Oct. 23, 2009) (“Sprint Nextel Comments”), Qualcomm Comments at 27-29; T-Mobile Comments at 19 (technical rules must allow for flexible uses in order to best meet demand and efficiently use spectrum); Verizon Wireless Comments at 17-19.

³⁰ AT&T Comments at 23.

³¹ Sprint Nextel Comments at 19.

³² Comments of the Telecommunications Industry Association, GN Docket No. at 6 (filed Oct. 23, 2009) (“TIA Comments”); AT&T Comments at 32; Motorola Comments at 15, n.22.

³³ TIA Comments at 6.

Inslee, Rick Boucher, and Fred Upton, to improve the process of reallocation of spectrum from Federal government uses to commercial uses.

B. Identifying the Right Spectrum is Critical.

Aside from maintaining successful spectrum policies, the FCC and NTIA must target not just any available spectrum for mobile wireless broadband but spectrum that will best facilitate the deployment of these critical services. In particular, CTIA urges policymakers to identify spectrum that is: (1) between 400 MHz and 3 GHz; (2) available in large, contiguous blocks; (3) adjacent to current spectrum allocations to the extent possible; and (4) internationally harmonized to the extent possible.

As CTIA described in detail in its initial Comments, policymakers must carefully consider differences in propagation characteristics and thus what types of services are better suited for various bands of spectrum. CTIA recommends that the Commission focus on spectrum bands below 3 GHz for future commercial mobile wireless applications. Most commenters agree with CTIA that lower band spectrum is most desirable for mobile broadband services.³⁴ “[O]ne factor affecting the number of cells needed for coverage is the frequency of the spectrum a carrier utilizes, with higher frequency bands requiring more cell sites than lower frequency bands.”³⁵ For example, commenters affirm that lower frequency spectrum is especially highly valued because it allows improved coverage and penetration from a single cell site.³⁶ Further, less power is needed for lower

³⁴ T-Mobile Comments at 10-11; Motorola Comments at 10 (arguing that mobile broadband operations are best suited to bands below 4 GHz); MetroPCS Comments at 9; Covad Comments at 6 (arguing that lower frequency signals propagate more easily through the air).

³⁵ T-Mobile Comments at 10-11.

³⁶ *See, e.g.*, Verizon Wireless Comments at 13 (noting that bands below 1 GHz are “highly desirable, as these lower frequency bands require fewer cell sites, and thus, would be less costly to deploy”).

frequencies to propagate effectively, which makes them particularly well suited for mobile applications where battery life is an important variable.

In addition, many commenters concur in the need for large, contiguous blocks of spectrum.³⁷ Long Term Evolution (“LTE”), Worldwide Interoperability for Microwave Access (“WiMAX”) and other next generation standards require large contiguous spectrum bands to achieve throughput speed and, to a degree, efficiency.³⁸ Thus, to support the high-bandwidth applications and usage demands that are forecast for LTE and WiMAX, service providers will need access to significant amounts of new spectrum in large contiguous blocks. As 3G Americas notes, “spectrum allocated for commercial mobile broadband should be as contiguous as possible. Current allocations are primarily based on 5 and 10 MHz blocks. Such allocations may have been appropriate for second, and even third, generation data services, but they are not sufficient to support advanced data services.”³⁹

Furthermore, numerous commenters affirm the benefits of international harmonization.⁴⁰ Aligning U.S. policies with international efforts is critical to lower equipment costs and lower costs of entry. The benefits of global harmonization are significant.⁴¹ In today’s global marketplace, when U.S. wireless providers use the same spectrum as the rest of the world, device manufacturers and applications developers can take advantage of economies of scale associated with making a

³⁷ 3G Americas Comments at 8; AT&T Comments at 16-17; T-Mobile Comments at 14; TIA Comments at 5 (suggesting that blocks should be at least 20-30 megahertz), Verizon Wireless Comments at 12-15.

³⁸ See AT&T Comments at 17; MetroPCS Comments at 5 n.14; Qualcomm Comments at 10.

³⁹ 3G Americas Comments at 8.

⁴⁰ See e.g., Comments of Bollore Telecom, GN Docket No. 09-51 at 2 (filed Oct. 23, 2009); Verizon Wireless Comments at 15; TIA Comments at 7; AT&T Comments at 18; Motorola Comments at 10.

⁴¹ Verizon Wireless Comments at 15.

single device or application that can be used almost anywhere, rather than having to devote scarce resources to making separate devices and applications for the U.S. marketplace.⁴² Such efforts will ultimately benefit American consumers and businesses through lower prices and more innovative services.

If U.S. consumers are to reap the benefits of a truly mobile broadband marketplace in a timely fashion, the process of identifying this spectrum must begin immediately. CTIA is committed to working with the FCC and NTIA to identify 800 MHz of additional spectrum for allocation to licensed commercial wireless services. As shown on the record, there is broad support for conducting a spectrum inventory.⁴³ Even in the absence of legislation, NTIA and the Commission can and should begin an inventory and assessment of spectrum usage to identify additional spectrum for commercial wireless use.

Moreover, this effort should not be limited in scope other than by focusing on any bands below 3 GHz that have not been previously licensed for exclusive-use, flexible commercial wireless services. CTIA urges policymakers to therefore keep all options on the table as they inventory potential spectrum reallocations – including Federal and non-Federal spectrum usage.

⁴² AT&T Comments at 18.

⁴³ Comments of Bright House Networks, GN Docket No. at 8 (filed Oct. 23, 2009)(suggesting that the FCC conduct spectrum inventory especially below 1 GHz) (“Bright House Comments”); CEA Comments at 1-2, 3-4 (suggesting that the FCC focus on spectrum not acquired at auction); T-Mobile Comments at 15 (“[T]he Commission should work closely with NTIA to conduct a rapid, targeted review of federal and non-federal spectrum allocations and uses from 300 MHz to 3.7 GHz.”); Verizon Wireless Comments at 20 (urging the FCC to undertake an inventory targeting the 400MHz to 5GHz bands); Sprint Nextel Comments at 26; AT&T Comments at 20; TIA Comments at 4-6; Reply Comments of 3G Americas, GN Docket No. 09-51 at 6 (filed Nov. 5, 2009); MetroPCS Comments at 21.

1. The Commission and NTIA Should Investigate Reallocation of Federal Spectrum that is Underutilized or that can be Relocated.

Numerous commenters agree that policymakers should carefully gauge (1) whether any Federal government spectrum is either being underutilized or (2) whether any Federal government spectrum usage could be accommodated on commercial networks.⁴⁴ CTIA agrees. With the significant evolution of commercial wireless services, many services historically available only to the government (*e.g.*, smart grid and machine-to-machine communications) are now commercially available.⁴⁵ Indeed, many Federal, state, and local government users already utilize commercial wireless products and services – and NTIA has previously launched efforts seeking methods for encouraging and growing use of commercial services by the Federal government.⁴⁶ As TIA explains, “it is vital that the Commission and NTIA work with all Federal agencies to educate Federal users about the need for and opportunities inherent in better spectrum management, including opportunities to migrate spectrum-based networks to other platforms.”⁴⁷ By increasing reliance by Federal, state and local government entities on existing commercial wireless providers, the Commission and NTIA will be better positioned to drive the most efficient use of spectrum resources, instead of enabling potentially duplicative and unnecessary network builds.

For example, as a near-term step, CTIA reiterates its support for the FCC and NTIA to reallocate the 1755-1780 MHz band for commercial wireless usage. Commenters in the record

⁴⁴ See Bright House Comments at 7 (expressing support for the Radio Spectrum Inventory Act); MetroPCS Comments at 2; Sprint Nextel Comments at 6; TIA Comments at 6; T-Mobile Comments at 15; Verizon Wireless Comments at 14 n.31.

⁴⁵ See Comments of Verizon Wireless, GN Docket No. 09-51 at 76 (filed Sep. 30, 2009) (“Verizon Wireless Innovation Comments”) (describing Verizon Wireless’s provisioning of wireless solutions to the utility industry including smart grid solutions); Comments of AT&T Inc., GN Docket No. 09-51 at 29 (filed Sep. 30, 2009) (“AT&T Innovation Comments”).

⁴⁶ See *e.g.*, <http://www.ntia.doc.gov/osmhome/lrsp/lrsp3.htm> (last visited Nov. 11, 2009).

⁴⁷ TIA Comments at 6.

showed strong support for this proposal to repurpose the 1755-1780 MHz band and pair it with the 2155-2180 MHz band, which has already been reallocated for commercial wireless use.⁴⁸ Moreover, as CTIA has previously noted, the 1710-1885 MHz band has been identified by ITU for commercial wireless uses, allowing for better international spectrum harmonization.⁴⁹ Additionally, the wireless industry has a great deal of recent experience in working with federal incumbents in the adjacent 1710-1755 MHz band over the past three years.⁵⁰ Finally, the 1755-1780 MHz band is an ideal target for repurposing because of the readiness with which it could be paired with the existing commercial wireless allocation in the 2155-2180 MHz band.⁵¹ The 2155-2180 MHz band is currently unpaired, a situation that 3G Americas has pointed out conflicts with the goals of global spectrum harmonization.⁵² Pairing of these two bands would enable an injection of an additional 50 MHz of spectrum that would be ideally suited for mobile broadband and other next generation wireless applications. Furthermore, such a pairing would conform to international allocations, reducing the time to market and costs of compatible devices and services, as providers and manufacturers could draw upon the work that has been done elsewhere with this spectrum. Finally, pairing these two allocations would address concerns by existing AWS-1 licensees that proposed TDD operations in the AWS-3 band would interfere with existing mobile wireless broadband networks.

⁴⁸ AT&T Comments at 19-20; T-Mobile Comments at 14; MetroPCS Comments at 11; Qualcomm Comments at 24; Comments of United States Cellular, GN Docket No. 09-51 at 17 (filed Oct. 23, 2009) (“US Cellular Comments”); Motorola Comments at 15; MetroPCS Comments at 6.

⁴⁹ *Id.*

⁵⁰ *See* NTIA Interim Report at 15. *See also*, CTIA September 29 *Ex Parte* at 21.

⁵¹ *See* CTIA September 29 *Ex Parte* at 21.

⁵² *See Ex Parte* Presentation of 3G Americas LLC, WT Docket No. 07-195 (filed Oct. 23, 2008).

Efforts at inventorying Federal spectrum usage must not stop with the 1755-1780 MHz band. And when NTIA and the Commission ultimately identify Federal government spectrum that can be repurposed for commercial use, the agencies should work together to ensure that applicants for reallocated spectrum will have a clear understanding of the technical requirements of incumbents and their relocation needs. As CTIA recently commented to NTIA:

The more commercial carriers know about Federal systems and licensee priorities, the better they will be at working within the relocation structure to achieve the best results for their customers and the public generally. The more Federal users understand about commercial licensees' plans and priorities, the more they will be able to coordinate and pre-plan to avoid unnecessary spectrum usage conflicts.⁵³

The facilitation of information sharing prior to an auction of reallocated Federal spectrum will ensure that new licensees are fully aware of and able to protect the needs of incumbent Federal government users.

2. The Commission Should Investigate Reallocation of Commercial Spectrum from Several Sources, Including Broadcasters, Microwave Services, and Satellite Providers.

In its initial comments, CTIA described two areas that are ripe for Commission attention: (i) broadcast spectrum; and (ii) spectrum below 3 GHz that is currently allocated for fixed wireless use. These proposals garnered significant support in the record.⁵⁴ In addition, commenters also

⁵³ Comments of CTIA at 3, NTIA Docket 0906231085-91085-01 (filed Aug. 21, 2009).

⁵⁴ See, e.g., Coleman Bazelon, The Brattle Group, *The Need for Additional Spectrum for Wireless Broadband: The Economic Benefits and Costs of Reallocations* (2009) attached to Comments of the Consumer Electronics Association, GN Docket Nos. 09-47, 09-51, 09-137 at 11 (filed Oct. 23, 2009) (“Bazelon Study”) (explaining “that there are significant gains from reallocating the broadcast spectrum and all interested parties could be made better off”); Bright House Networks Comments at 8 (explaining that the Commission should inventory existing spectrum and reallocate services to dedicate additional mobile wireless broadband below 1 GHz); Qualcomm Comments at 24 (explaining that additional mobile broadband spectrum “needs to come from bands below 3 GHz” and that “[t]here is no viable business case for the use of spectrum above 3 GHz for mobile broadband because a network on such spectrum would require far too many base stations”); T-Mobile Comments at 15 (proposing that “the Commission should work closely with NTIA to conduct a rapid, targeted review of federal and non-federal spectrum allocations and uses from 300 MHz to 3.7 GHz”).

encourage the Commission to undertake an examination of spectrum allocated to U.S. satellite providers.⁵⁵ CTIA agrees and believes that a review of current satellite authorizations, coupled with an assessment of whether such providers are fully and efficiently utilizing their spectrum allocations, will inform whether this spectrum should be reallocated for licensed CMRS wireless broadband use.

a. The Commission Must Consider All Options For Repurposing Broadcast Television Spectrum.

Based on a careful review of the record, CTIA again urges the Commission to take a hard look at the spectrum use of the U.S broadcast industry and urges the Commission to consider reallocating this valuable spectrum to services better able to serve the needs of U.S. consumers. As detailed below, broadcast television spectrum in the 470-698 MHz band is ideally suited to the provision of mobile broadband services. In particular, CTIA encourages the Commission to carefully consider a study commissioned by the Consumer Electronics Association, authored by Coleman Bazelon, which concludes that huge economic gains could be enjoyed by broadcasters, wireless service providers, and consumers alike if the broadcast spectrum was reallocated for commercial wireless use.⁵⁶

(i) The Public Interest Favors Reallocation of Broadcast Television Spectrum.

The Association for Maximum Service Television, Inc. (“MSTV”) and the National Association of Broadcasters (“NAB”) (together, “broadcasters”) urge the Commission to heed the

⁵⁵ Sprint Nextel Comments at 2 (commenting that the FCC “should also unleash or reallocate currently underutilized spectrum, including in the 2 GHz [MSS bands]...”); MetroPCS Comments at 11-12.

⁵⁶ See, e.g., Bazelon Study at 1, 11.

public interest in deciding how the broadcast television spectrum should be allocated.⁵⁷ CTIA agrees – and the public interest clearly favors reallocation of broadcast television spectrum for commercial mobile wireless broadband uses. Contrary to statements of NAB and MSTV that the broadcast television industry “is engineered to serve core public interest goals,”⁵⁸ the shareholders who own commercial television broadcasters expect a return on their investment that goes beyond solely acting in the “public interest.” In fact, recent media reports make clear that broadcasters must hold on to unused and underutilized spectrum only to profit from mobile TV and multicasting – not to ensure the public receives free over the air programming.⁵⁹ Moreover, as discussed in the Consumer Electronics Association’s Bazelon Study, “the over-the-air portion of broadcasting is becoming less economically relevant to broadcasters.”⁶⁰

By comparison, Congress (through the American Recovery and Reinvestment Act),⁶¹ the Commission, and the Obama Administration all agree that the proliferation of broadband access is of vital importance to the economy of the United States and to maintaining U.S. world leadership. In the Recovery Act, Congress provided \$7.2 billion to the Department of Agriculture’s Rural Utilities Service and NTIA to make grants and loans to expand broadband deployment and for other

⁵⁷ See Comments of the Association for Maximum Service Television, Inc. and the National Association of Broadcasters, GN Docket 09-51 at 7-9 (filed Oct. 23, 2009) (NAB-MSTV Comments).

⁵⁸ NAB-MSTV Comments at 8.

⁵⁹ Josh Wein, *Spectrum Needed: Broadcasters Debate Mobile DTV Business Model*, *Prather Says*, 29 COMMUNICATIONS DAILY 216 (Nov. 10, 2009) (“Broadcasters need to keep their wireless spectrum if they want to exploit the opportunities of mobile DTV and multicasting . . . Multicasting is already a profitable business for Gray [TV], [Bob Prather] said. The potential to create new business around mobile DTV should keep broadcasters from being enticed to give up their spectrum, he said.”).

⁶⁰ Bazelon Study at 1.

⁶¹ American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009) (“Recovery Act”). The Recovery Act was signed into law on February 17, 2009.

important broadband projects. The Recovery Act also charges the Commission to create a national broadband plan “that seeks to ensure that every American has access to broadband capability and establishes clear benchmarks for meeting that goal.”⁶² The Commission also has made clear that access to broadband – particularly mobile broadband – is the key to the economic well-being of this country. In a recent speech, Chairman Genachowski noted “that mobile is a key part of the strategy for broadband At the FCC we are studying ways to accelerate the roll-out of 4G – by ensuring the availability of sufficient spectrum”⁶³ The only way to achieve ubiquitous high-speed access to the Internet that Congress, the Commission and the President are seeking, is through mobile wireless broadband providers. As such, it is clear that the public interest favors Commission consideration of broadcast television spectrum reallocation for licensed commercial mobile wireless broadband services.

(ii) Broadcaster Claims of Spectrum Efficiency Do Not Add Up.











The broadcasters’ claims of greater spectral efficiency fall flat by any measure and particularly when compared with the world-leading record of the U.S. commercial wireless sector. As an initial matter, broadcasters overstate their own gains in spectral efficiency due to the digital television (“DTV”) transition from analog to digital signals.⁶⁴ Particularly telling is that these claims ignore the fact that broadcasters finally upgraded their outdated analog technology to more modern spectrum technologies reluctantly and only after a Congressional mandate with public

⁶² A National Broadband Plan for Our Future, Notice of Inquiry, FCC 09-31 ¶6 (rel. Apr. 8, 2009).

⁶³ Prepared Remarks of Chairman Julius Genachowski, Federal Communications Commission, “ICT: Global Opportunities and Challenges” International Telecommunication Union Global Symposium for Regulators Beirut, Lebanon November 10, 2009 available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-294594A1.pdf.

⁶⁴ NAB-MSTV Comments at 9-11 (describing broadcast television bands as “among the most efficient” within the spectrum below 3.7 GHz).

funding for technology change-outs was enacted. By contrast, in less than 30 years, the U.S. wireless industry has not only moved from analog to digital, but has gone from analog to digital, to 3rd generation to 3.5 generation, to 4th generation.⁶⁵ An unusual but telling sign of the rapid pace of innovation in the commercial wireless industry is that, rather than needing to be prompted to migrate from analog to digital technology, the wireless industry was actually restrained by the FCC from getting rid of inefficient analog technology.⁶⁶ Thus, broadcasters' gross mischaracterizations of the spectral efficiencies of commercial wireless services are clearly contradicted by the consistent track record of the U.S. wireless industry at driving the most spectrum usage of any country in the world.⁶⁷ This point is further demonstrated by this chart of national wireless service:

	 USA	 Japan	 Germany	 U.K.	 France	 Italy	 Canada	 Spain	 S. Korea	 Mexico
Subscribers**	270.3m	110.6m	107.0m	76.8m	57.5m	89.9m	21.7m	53.1m	46.2m	79.4m
Average Consumers' Minutes of Use per Month**	830	134	102	193	251	128	420	149	306	170
Average Revenue per Minute – A Measure of the Effective Price per Voice Minute**	\$0.05	\$0.25	\$0.15	\$0.10	\$0.14	\$0.15	\$0.08	\$0.19	\$0.07	\$0.06
Efficient Use of Spectrum – Subscribers Served per MHz of Spectrum Allocated	660,073	314,985	350,819	217,687	153,497	288,696	105,853	148,324	198,283	661,666
Spectrum Assigned for Commercial Wireless Use	409.5 MHz*	347 MHz	305 MHz	352.8 MHz	374.6 MHz	311.4 MHz	205 MHz	358 MHz	233 MHz	120 MHz
Potentially Usable Spectrum in the Pipeline***	50 MHz	165 MHz	340 MHz	355 MHz	72 MHz	254 MHz				120 MHz

*Figure includes AWS-1, 700 MHz spectrum not yet in use and 55.5 MHz of spectrum at 2.5 GHz.
** Glen Campbell, et al., "Global Wireless Matrix 1Q09," Merrill Lynch, June 25, 2009, at Table 1.
***Complete information on "pipeline" spectrum was not available for all countries at the time of filing/submitting.

⁶⁵ See Verizon Innovation Comments at 9-11; AT&T Innovation Comments at 29-30.

⁶⁶ See generally, In the Matter of Year 2000 Biennial Regulatory Review – Amendment of Part 22 of the Commission's Rules to Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and Other Commercial Mobile Radio Services, WT Docket No. 01-108, *Report and Order*, 17 FCC Rcd 18401 (2002).

⁶⁷ See CTIA Comments at 25.

As this chart shows, U.S. carriers pack more subscribers using more minutes of calling and more megabytes of data into each megahertz of spectrum than any other nation's providers. Carriers have achieved this efficiency by making significant investments in highly advanced technologies, along with designing and redesigning networks to get the most out of their spectrum holdings.

Moreover, broadcasters' claims of efficiency in their own operations are entirely misplaced. With high-power use and technology, over-the-air television broadcasting not only requires the 6 MHz channel licensed to the provider, but also requires between 6 and 12 MHz of "buffer" on either side of the channel to accommodate the interfering effect of the strong broadcast signal (approximately 1 megawatt for most large broadcast television stations).⁶⁸ Therefore, the true spectrum usage of one DTV broadcast station can effectively be as large as 18 MHz in a market.

Despite occupying in many cases as much as 18 MHz of spectrum, over the air services actually provided by television broadcasters could readily be accomplished in significantly less spectrum. While initially high definition over the air video programming required the full 6 MHz of spectrum previously allotted to analog television service, the reality is that television broadcasters have broadly abandoned providing high definition television on a full time basis and instead are relying upon standard definition "multicast" streams and, just recently announced, mobile television activities to attempt to expand their use of the full television spectrum band. Through compression techniques and modern broadcasting equipment and television receivers, broadcast television can now accommodate many standard definition video streams within the 6 MHz of licensed television spectrum. Given today's growing spectrum crisis for usable spectrum below 3 GHz, the

⁶⁸ For broadcast television operators to use adjacent television channels, the broadcast transmitters must be co-located (or nearly so) to ensure that the signal strength received by televisions is equalized. Without extensive coordination among broadcast licensees to co-locate operations, first adjacent channel interference cannot be overcome. *See e.g.*, 47 C.F.R. §73.610(c)(1) (requiring a distance of 54.5 miles between adjacent channel broadcast television transmitters).

Commission must consider revisiting the determination that this type of utilization of scarce spectrum resources is still in the public interest.

In contrast, in almost every market where spectrum has been cleared of incumbent users mobile wireless broadband providers are using all, or shortly will be using all, of the spectrum available to them. Indeed, as the Chairman has recognized, we have an impending “spectrum crisis” as broadband demand outstrips spectrum supply.⁶⁹ In short, broadcasters conflate the idea of “occupying the spectrum” with “maximizing use of spectrum.” Maximizing use of spectrum contemplates more than merely providing a service over the spectrum resource, but also providing service to the most number of subscribers who are actually using the product or service over that spectrum resource. By this metric, U.S. wireless providers are the most efficient spectrum users worldwide.⁷⁰ Indeed, compared to broadcasters, the wireless industry is using its spectrum to reach many more consumers: Broadcasters, who hold rights to use better than 200 MHz of spectrum between 400 MHz and 3 GHz use their spectrum to serve fewer than 10 percent of American

⁶⁹ Julius Genachowski, Chairman, Federal Communications Commission, Remarks at CTIA Wireless IT & Entertainment: America’s Mobile Broadband Future, 1-2 (Oct. 7, 2009) (stating that, “Spectrum is the oxygen of our mobile networks. While the short-term outlook for 4G spectrum availability is adequate, the longer-term picture is very different. In fact, I believe that the biggest threat to the future of mobile in America is the looming spectrum crisis.”).

⁷⁰ “With more than 651,000 subscribers served per MHz of spectrum allocated, U.S. carrier efficiency far surpasses that of other carriers in the OECD’s top ten countries by GDP.” *Ex Parte* Communication from Christopher Guttman-McCabe, CTIA—The Wireless Association, to Julius Genachowski, Chairman, and Michael J. Copps, Robert M. McDowell, Mignon Clyburn, and Meredith Attwell Baker, Commissioners, Federal Communications Commission, GN Docket No. 09-51 at 16 (filed Sept. 29, 2009) (“CTIA Sept. 29 *Ex Parte*”); *see also* AT&T Comments at 11-13 (describing use of technology to increase spectral efficiency); Verizon Wireless Comments at 5-7 (same).

households,⁷¹ while mobile wireless broadband providers are using their spectrum holdings to bring broadband to the person for more than 276 million American subscribers.⁷²

(iii) The Spectrum Occupied by Broadcasters is Uniquely Suited to Mobile Broadband Services.

The frequencies currently used for broadcast television would be some of the most ideal spectrum for mobile broadband use. UHF television channels 14-51 occupy the frequencies between 470 and 698 MHz, in the spectrum between 400 MHz and 3 GHz that has been identified by CTIA and others as the most appropriate spectrum for mobile broadband services.⁷³ In fact, the Commission itself, in the context of the digital television transition, has several times referred to the broadcast spectrum as “beachfront property” that would be ideal for mobile communications services.⁷⁴ As explained by Verizon Wireless and others, these bands have favorable propagation characteristics that “allow sufficient mobility, while also affording an acceptable trade-off between

⁷¹ See Bazelon Study at 15.

⁷² CTIA Sep. 29 *Ex Parte* at 16; CTIA Semi-Annual Wireless Survey, Mid-Year 2009 Top-Line Survey Results at 2, available at http://files.ctia.org/pdf/CTIA_Survey_Midyear_2009_Graphics.pdf.

⁷³ See AT&T Comments at 17; CTIA Comments at 18; 3G Americas Comments at 7; MetroPCS Comments at 7; Motorola Comments at 10; Verizon Wireless Comments at 13; see also Technical and Operational Information for Identifying Spectrum for the Terrestrial Component of Future Development of IMT-2000 and IMT-Advanced, Report ITU-R M.2079, at 6 (2006).

⁷⁴ See FCC Media Bureau Staff Report, Concerning Over-the-Air Broadcast Television Viewers, MB Docket No. 04-210, 2005 WL 473322 (Feb. 28, 2005) (“The 108 MHz of spectrum available because of the digital transition “is ‘beachfront’ spectrum, with propagation characteristics that make it ideal for providing wireless broadband access through foliage and building walls.”); Statement of Commissioner Robert M. McDowell before the House Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce (Apr. 15, 2008); Frank Saxe, “Digital Age Airwaves Battle Begins: Spare Spectrum Due to Digital TV Conversions May Be Key to Expansion of Wireless Industry,” *Billboard* (Dec. 23, 2000) (quoting FCC Chairman Kennard as stating that “the broadcast community is sitting on 150 megahertz of prime beachfront property - that is a public resource that is lying fallow”).

coverage and cost.”⁷⁵ Moreover, television broadcasting spectrum is directly adjacent to the recently auctioned 700 MHz spectrum (698-806 MHz) – allowing the potential for contiguous blocks of spectrum for mobile broadband services.

In a recent study sponsored by the Consumer Electronics Association, economist Coleman Bazelon set out to estimate a total financial value of the broadcast spectrum.⁷⁶ Bazelon concluded that huge economic gains could be enjoyed by broadcasters, wireless service providers, and consumers alike if the broadcast spectrum was reallocated for commercial wireless use. Based upon his detailed economic analysis, Bazelon calculated that the total market value of all full power broadcast spectrum if made available for mobile broadband uses could be as much as \$62 billion.⁷⁷ Bazelon estimated that broadcasters could make their spectrum available for between \$9 billion and \$12 billion, resulting in a direct benefit of up to \$51 billion.⁷⁸ However, the overall economic benefit of a reallocation, according to Bazelon, is much greater than this. Bazelon calculated that the consumer surplus – a measure of the value derived by a consumer above what they paid for a good or service – could be greater than \$1 trillion.⁷⁹

(iv) Spectrum Alternatives Suggested By Broadcasters Are Inappropriate.

In seeking to bolster their specious argument that significant excess spectrum is available for mobile wireless broadband, the broadcasters suggest that wireless service providers look to the 5.7

⁷⁵ Verizon Wireless Comments at 13.

⁷⁶ See Bazelon Study.

⁷⁷ Bazelon Study at 13.

⁷⁸ *Id.* at 19.

⁷⁹ *Id.* at 2.

GHz unlicensed band.⁸⁰ However, this proposal ignores the practical, technological, and economic concerns that make mobile wireless broadband service untenable both in higher frequency bands and in unlicensed spectrum. As discussed in CTIA’s initial comments, higher frequency spectrum bands are ill-suited to mobile broadband deployment over large areas because of inferior propagation characteristics and the need for more base stations.

Additionally, as explained by numerous commenters in this proceeding, licensed spectrum is essential for the build-out of the large-scale mobile networks that are necessary for the wide deployment of the most advanced commercial mobile broadband services.⁸¹ By contrast, in an unlicensed environment, a wireless network operator cannot predict the amount or type of other traffic in the band, making it impossible for broadband service providers to control for interference or network congestion. “Indeed,” as AT&T explained, “as the number of unlicensed devices grows, interference becomes more prevalent and there is no clear means of addressing such interference to increase the quality of service.”⁸² As MetroPCS stated, “[u]ncertainty of this nature deters investment because of the unquantifiable risk.”⁸³ Thus, although unlicensed platforms act as a useful complement to other broadband solutions as a means to provide access in a small area (*i.e.*, a Wi-Fi hotspot), unlicensed use has limitations that undermine its use for large-scale mobile networks.⁸⁴ Few, if any, network operators would be willing to make the substantial infrastructure

⁸⁰ NAB-MSTV Comments at 4.

⁸¹ See AT&T Comments at 13-15; MetroPCS Comments at 7; Qualcomm Comments at 32-33; T-Mobile Comments at 17; Verizon Wireless Comments at 10-11.

⁸² AT&T Comments at 14; see also Qualcomm Comments at 32 (“[U]nlicensed devices are less reliable than those that use licensed spectrum, and as unlicensed devices proliferate, their reliability is unlikely to improve.”).

⁸³ MetroPCS Comments at 9.

⁸⁴ See AT&T Comments at 13-14.

investments necessary to construct a mobile broadband network based on unlicensed spectrum, the broadcasters' contrary implications notwithstanding.

- (v) The Commission Should Not Take Short-Term Actions that Would Limit Long-Term Access to this Valuable Spectrum.

The potential value of the broadcast spectrum is so significant, the Commission should take great care not to create roadblocks that would undermine its ability to eventually reallocate all or portions of this spectrum for commercial mobile wireless use. For example, as the Commission begins to authorize use of the television white spaces it should investigate whether to begin with authorizations at the bottom end of the available white spaces. To the extent the Commission should decide that broadcasters, white space devices and mobile broadband services should continue to coexist in the television bands, the Commission would do well to ensure that additional spectrum for licensed mobile broadband services is available at the top end of the television band, adjacent to existing 700 MHz allocations.

In addition, the Commission should consider ways to repurpose portions of this valuable spectrum as soon as possible. For example, CTIA urges the Commission to evaluate the broadcast spectrum bands closest to the 700 MHz allocation and consider whether it would be possible to immediately reallocate unused DTV channels to licensed mobile wireless broadband use. In geographic areas where channel 51, for example, is unused, reallocation to licensed wireless broadband services will provide a needed and immediate infusion of spectrum to help meet growing consumer demand for wireless broadband services.

Finally, CTIA notes that the Commission must reject the unfounded and self-serving proposals of Shure Incorporated (“Shure”) regarding the migration of Low Power Auxiliary Service (“LPAS”) and other unauthorized devices in the exclusively licensed 700 MHz band,⁸⁵ In spite of

⁸⁵ Comments of Shure Incorporated, GN Docket No. 09-51 (filed Oct. 23, 2009) (“Shure Comments”).

Shure's assertion that wireless microphones should not be relocated to new spectrum, the Commission and various affected parties have contemplated that low power broadcast auxiliary devices would lose their secondary status, and would need to vacate the band, since at least 2001.⁸⁶ Indeed, the Commission itself launched a proceeding more than a year ago that sought to make clear that LPAS devices, including wireless microphones, would no longer be permitted in the 700 MHz band.⁸⁷ CTIA urges the Commission to move expeditiously to end the use of the licensed 700 MHz spectrum by LPAS devices.⁸⁸

As described above, the Commission should take care to make sure that it does not inadvertently hinder long-term access to valuable broadcast spectrum for mobile broadband as it addresses these "short term" issues.

⁸⁶ For instance, when the Commission adopted service rules in 2001 for the Lower 700 MHz Band (698-746 MHz), it declined to grant a request filed by the Society of Broadcast Engineers, Inc. (SBE) that the Commission "afford continued secondary status to Part 74 low power broadcast auxiliary devices (such as wireless microphones) operating in the Lower 700 MHz Band, and to establish a new service in Part 95 of our Rules to accommodate their use." *See* Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), GN Docket No. 01-74, *Report and Order* 17 FCC Rcd at 1037 ¶ 33.

⁸⁷ *See* Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band; Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition; WT Dkt. No. 08-166; WT Dkt. No. 08-167; *Notice of Proposed Rulemaking and Order*, FCC 08-188 ("LPAS NPRM").

⁸⁸ In seeking a remedy for the use of low power auxiliary service devices in the 700 MHz band, the Commission must quickly implement a comprehensive solution that includes: prohibiting the manufacture for domestic use, import, shipment, domestic display, marketing, offer for sale, and sale of LPAS devices capable of operating in the 698-806 MHz ("700 MHz") band; clarifying that the Commission intends the 700 MHz band to be cleared of all LPAS devices, consistent with its objectives to make the spectrum fully available to public safety and commercial licensees as part of the DTV Transition; requiring that operation of all LPAS devices in the 700 MHz band cease by Feb. 18, 2010; and directing publication of a Consumer Advisory to alert the general public of the changes being implemented in the use of wireless microphones and other LPAS devices.

b. The Commission Should Consider the Relocation of Fixed Wireless Services Below 3 GHz.

With respect to other licensed spectrum below 3 GHz, the Commission should also consider the relocation of spectrum currently allocated for fixed wireless use. As discussed in more detail above and echoed by commenters, spectrum below 3 GHz is ideally suited for commercial mobile wireless services. Qualcomm explains that the FCC “should focus on identifying, allocating, and auctioning licensed spectrum below 3 GHz and that “[n]o licensed band below 3 GHz should be ruled out.”⁸⁹ Additionally, Bright House Networks explains that “[p]ropagation characteristics of spectrum below 1 GHz means that fewer transmitters are required to cover a geographic area than would be required to provide service to the same geographic area using higher spectrum bands.”⁹⁰ In contrast, Bright House Networks explains that “for other services where short or directionalized transmission paths are desirable, spectrum above 1 GHz can be employed.”⁹¹ Currently there are significant amounts of spectrum licensed to fixed microwave services, such as those in the 900 MHz band, that could potentially be reallocated.⁹² Thus, consistent with its prior comments in this docket, CTIA believes that any spectrum licensed to fixed services below 3 GHz should also be carefully considered as part of the commercial mobile broadband spectrum relocation process.

⁸⁹ Qualcomm Comments at ii.

⁹⁰ Bright House Networks Comments at 9.

⁹¹ *Id.* at 9.

⁹² *See e.g.*, 47 C.F.R. §101.101 (showing spectrum in the 928 to 960 MHz band allocated for fixed microwave use).

c. The Commission Should Investigate Spectrum Allocated to U.S. Satellite Providers.

Finally, commenters also encourage the Commission to undertake an examination of spectrum allocated to U.S. satellite providers.⁹³ CTIA agrees and believes that a review of current satellite authorizations, coupled with an assessment of whether such providers are fully and efficiently utilizing their spectrum allocations, will inform when this spectrum may be reallocated for licensed CMRS wireless broadband use. For example, the 2 GHz band was licensed to the mobile satellite service (“MSS”) for the purpose of offering of mobile voice, data, paging, internet and other services to national and international consumers. But as MetroPCS noted, the 2 GHz spectrum band “has been dedicated to MSS use for more than a decade and yet, to this day, MetroPCS knows of no substantial, commercially-viable mobile satellite services being provided to consumers on a regular basis.”⁹⁴ Moreover, the 2 GHz MSS spectrum is adjacent to spectrum licensed to the Personal Communications Service (“PCS”) and Advanced Wireless Service (“AWS”) – one of the key characteristics for spectrum that should be considered for reallocation.⁹⁵ Eight systems⁹⁶ were initially licensed in the 2 GHz band, but now only two systems remain, and one of those, DBSD North America (ICO), has recently requested bankruptcy protection for its North American affiliate under the name DBSD North America. There are also other MSS

⁹³ Sprint Nextel Comments at 2 (commenting that the FCC “should also unleash or reallocate currently underutilized spectrum, including in the 2 GHz [MSS bands]....”); MetroPCS Comments at 11-12.

⁹⁴ MetroPCS Comments at 11-12.

⁹⁵ The PCS upper band ends at 1995 MHz (if the G block is included) and should the PCS H Block proceeding be completed, PCS will extend to 2000 MHz. The lower 2 GHz MSS spectrum block is from 2000 to 2020 MHz. The AWS upper band runs from 2110 to 2155 MHz. The AWS-2 and AWS-3 spectrum, which have yet to have service rules completed, extends from 2155 to 2180 MHz. The upper 2 GHz MSS spectrum band is from 2180 to 2200 MHz.

⁹⁶ Initial licensees included Boeing, Celsat, Constellation, Globalstar, ICO, Iridium, Mobile Communications Holdings, Inc. (MCHI), and TMI.

providers in the 1.5, 1.6 and 2.4 GHz bands that have existing satellite systems that should also be considered as part of any spectrum inventory below 3 GHz.⁹⁷ Given the urgent need for additional spectrum for mobile broadband demonstrated on the record, the FCC should assess whether satellite providers are fully and efficiently utilizing their spectrum authorizations.

⁹⁷ SkyTerra and Inmarsat are licensed in the 1525-1559 MHz and 1626.5-1660.5 MHz bands; Iridium is licensed in the 1618-1626.5 MHz band and Globalstar is licensed in the 1610-1618 MHz and the 2483.5-2500 MHz bands.

IV. CONCLUSION

For the reasons discussed above, the Commission and other policymakers should act expeditiously to identify and allocate a significant amount of additional spectrum for licensed commercial wireless use. Such an allocation will be an important step towards meeting the rapidly accelerating demand for mobile wireless broadband services and maintaining a competitive and innovative wireless ecosystem. To ensure that limited spectrum resources are used effectively, the FCC should continue to employ an exclusive-use, flexible rights licensing model that allows the market and consumers, rather than regulators, to determine the highest and best use of spectrum.

Respectfully submitted,

By: /s/ Scott K. Bergmann

Scott K. Bergman
Assistant Vice President, Regulatory Affairs

Michael F. Altschul
Senior Vice President and General Counsel

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

David Redl
Director, Regulatory Affairs

CTIA-THE WIRELESS ASSOCIATION®
1400 Sixteenth Street, NW
Suite 600
Washington, D.C. 20036
(202) 785-0081

Dated: November 13, 2009