

**Before the
Federal Communications Commission
Washington, DC 20554**

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| In the Matter of: |) | |
| |) | GN Docket No. 09-47 |
| Comment Sought on Spectrum for |) | GN Docket No. 09-51 |
| Broadband |) | GN Docket No. 09-137 |
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**COMMENTS OF
THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

INTRODUCTION.

The Telecommunications Industry Association (TIA) hereby submits comments to the Federal Communications Commission (Commission) in the above-captioned proceeding.¹ TIA lauds the Commission for further evaluating the sufficiency of current spectrum allocations, and welcomes the opportunity to provide insight into methods of meeting increasing demand for spectrum to deploy next-generation wireless broadband services.

TIA represents the global information and communications technology (ICT) industry through standards development, advocacy, tradeshow, business opportunities, market intelligence and world-wide environmental regulatory analysis. Its 500 member companies manufacture or supply the products and services used in the provision of broadband and broadband-enabled applications. Since 1924, TIA has enhanced the business environment for broadband, mobile wireless, information technology, networks, cable, satellite and unified communications. Members' products and services empower communications in every industry and market, including healthcare, education, security,

¹ Comment Sought on Spectrum for Broadband (NBP Public Notice #6), Public Notice, GN Dkt. Nos. 09-47, 09-51 & 09-137, DA 09-2100 (rel. Sept. 23, 2009) (Spectrum for Broadband Request for Comment).

public safety, transportation, government, the military, the environment and entertainment.

SUMMARY.

As Chairman Genachowski has made clear, mobile broadband is rapidly becoming a central part of how Americans communicate, stay informed, learn, and benefit from improved health care and energy resource management.² This trend has increased demand for a variety of wireless technologies, platforms, service, applications, and devices. TIA forecasts that, as consumers increase demand for new wireless broadband applications, sales of smartphones capable of delivering wireless broadband in 2012 will have increased by 23.5 percent over sales in 2008.³

TIA agrees with Chairman Genachowski that, given the dramatic increase in demand for terrestrial wireless broadband and the spectrum needs of networks, America is facing a shortage of spectrum allocated to services in which these networks can operate.⁴ The time is right to recognize that terrestrial wireless broadband deployment and innovations are deeply impacted by spectrum availability. Without making more spectrum available in high usage areas, the US risks losing its leadership position in technology for networks, devices, and applications. The ability of wireless technologies to further

² Julius Genachowski, Chairman, Federal Communications Commission, Remarks at CTIA Wireless IT & Entertainment: America's Mobile Broadband Future, 1-2 (Oct. 7, 2009) (Chairman Genachowski CTIA Remarks) (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.").

³ See 2009 TIA Market Review & Forecast at 4-21.

⁴ Chairman Genachowski CTIA Remarks at 5 (stating that, "We are fast entering a world where mass-market mobile devices consume thousands of megabytes each month. So we must ask: what happens when every mobile user has an iPhone, a Palm Pre, a Blackberry Tour or whatever the next device is? What happens when we quadruple the number of subscribers with mobile broadband on their laptops or netbooks? The short answer: we will need a lot more spectrum.").

benefit all Americans depends on the rapid allocation of additional spectrum for broadband use.

TIA urges the Commission to continue its technology-neutral spectrum allocations and create a new and innovative spectrum band plan. Such a plan is, as Chairman Genachowski identified, crucial to solving our spectrum shortfall.⁵ To this end, TIA urges the Commission to identify Federal and non-Federal spectrum that can be allocated for wireless broadband services. These services can provide broadband access and cutting-edge applications to the benefit of consumers and the healthcare, education, security, public safety, transportation, government, defense, environment, and entertainment sectors. As the Commission evaluates spectrum allocation to maximize consumer welfare, TIA urges it to acknowledge the differences in spectrum usage in different bands. Further, it is important that the Commission work to ensure that a technically and economically viable interoperable broadband public safety network is deployed. A spectrum plan for the 21st century must factor in spectrum uses that best promote societal benefits, while balancing the needs and value of new services with those of existing spectrum users. Additionally, the Commission's plan should acknowledge the public benefits of both licensed and unlicensed technologies. Moreover, commercial licenses that are granted with flexibility so that licensees can deploy services most beneficial to customers will maximize scarce spectrum resources. Finally, the Commission should promote market-based spectrum rules to maximize spectrum for wireless broadband.

⁵ *Id.* at 6 (“That brings me to the second way to close the spectrum gap -- reallocating spectrum currently being used for other purposes.... We must identify spectrum that can best be reinvested in mobile broadband.”).

DISCUSSION.

I. THE COMMISSION SHOULD INCREASE SPECTRUM ALLOCATIONS FOR BOTH LICENSED AND UNLICENSED USE, AND MEASURE EFFICIENCY BASED UPON DIFFERENCES IN SPECTRUM TYPE AND USE.

- a. The Commission Should Inventory Current Spectrum And Allocate Larger Spectrum Blocks for Terrestrial Wireless Broadband.

The Commission requests comment on the ability of current spectrum allocations to support build-outs and the anticipated surge in demand and throughput requirements.⁶

Terrestrial wireless networks are speeding toward deployment readiness, but their rapid availability to consumers will be deeply impacted by a lack of spectrum availability. The International Telecommunications Union (ITU) has estimated that the United States will need approximately 840 MHz of spectrum to satisfy demand for broadband in 2010, and approximately 1,720 MHz by 2020.⁷ Yet, the United States only has a fraction of that spectrum currently available for such use.⁸

There are numerous wireless broadband applications currently being deployed in all segments of the economy and the success of these deployments will be tied to the continued availability of spectrum. For example, wireless broadband applications currently are being used to improve, among other things, public safety⁹, healthcare,¹⁰ education,¹¹ energy efficiency,¹² personal security,¹³ and manufacturing.¹⁴

⁶ Spectrum for Broadband Request for Comment at 4.

⁷ See International Telecommunication Union, *Report ITU-R M.2078: Estimated Spectrum Bandwidth Requirements for the Future Development of IMT-2000 and IMT-Advanced*, at 25, Table 25 (2006).

⁸ For example, only approximately 410 MHz of spectrum is currently allocated for commercial wireless use. See Letter from Christopher Guttman-McCabe, Vice President, Regulatory Affairs CTIA – The Wireless Association® to Marlene H. Dortch, Secretary, Federal Communications Commission at 9 (May 12, 2009).

⁹ For example, the Regional Wireless Broadband Network, the first and only 700 MHz broadband network in the United States dedicated to public safety users, was built by the District of Columbia's Office of the

The Commission often allocates spectrum in 5 and 10 MHz blocks¹⁵ – an allocation size insufficient to support wireless broadband networks. Wider bandwidth allocations – in at least 20 to 30 MHz blocks – are needed for future data-intensive wireless broadband services and will offer performance advantages that will allow resources to be pooled among users. This, in turn, will enable service providers to support faster bandwidth-intensive services for more users. Accordingly, the Commission should create a spectrum band plan that allocates new spectrum in contiguous and larger blocks to support deployment of next-generation wireless broadband networks.

Chief Technology Officer with an experimental license in the 700 MHz band provided by the Commission. See District of Columbia website, available at <http://octo.dc.gov/octo/cwp/view,a,1304,q,628505,octoNav,%7C32780%7C.asp> (last visited Oct. 20, 2009)

¹⁰ For instance, new smart phone devices that rely on broadband access are being used by both patients and physicians. These technologies fostered “LifeStat™ Remote Monitoring and Health Management,” a service provided by Alcatel-Lucent and SaskTel that records and transmits daily blood glucose and blood pressure readings in the Canadian Province of Saskatchewan. See LifeStat™ press release, July 10, 2008, available at <http://www.lifestat.ca/public/News/News/tabid/69/Default.aspx> (last visited Oct. 20, 2009)

¹¹ For example, Ericsson partnered with Stanford University to bring Internet connectivity to many schools in Africa. This allowed Stanford professors and students to connect with their peers at three African universities through the use of smart phones and other tools. See Ericsson Comments, GN Docket No. 09-157 at 9 (filed Sept. 30, 2009); see also Abilene Christian University News & Events, *Mobile learning enhances student and faculty experience at ACU*, available at http://www.acu.edu/news/2008/080815_mLearning_Lau.html (last visited Sept. 29, 2009); Reuters, *ACU’s Innovation Attracts Global Attention; Hundred Coverage on Campus to Explore Mobile Learning* (Jan. 28, 2009), available at <http://www.reuters.com/article/pressRelease/idUS230336+28-Jan-2009+BW20090128> (last visited Oct. 19, 2009).

¹² Smart Grid technology, for example, utilizes broadband connectivity to improve energy efficiency. See Comment Sought on the Implementation of Smart Grid Technology, Public Notice, DA 09-2017 (rel. Sept. 4, 2009).

¹³ The Higher Education Opportunity Act of 2008 states that higher education institutions must have procedures to “immediately notify the campus community upon the confirmation of a significant emergency or dangerous situation involving an immediate threat to the health or safety of students or staff occurring on the campus.” Pub. L. No: 110-315. Applications have been developed to satisfy this mandate. See Press Release, Rave Mobile Safety, *Rave Wireless Enhances Campus Safety Solution Using T-Mobile’s Nationwide Network* (Oct. 30, 2008), available at <http://www.ravewireless.com//10/30/2008>.

¹⁴ Manufacturing can be improved through the use of machine-to-machine devices that rely on wireless broadband connectivity.

¹⁵ See, e.g., 47 C.F.R. § 24.229 (identifying some Broadband PCS blocks of 5 MHz); id. § 27.5 (listing various frequency blocks in the WCS band of 5 and 10 MHz, in the AWS band of 5 and 10 MHz, and in the 700 MHz band of 5 MHz).

The Commission can begin this initiative by conducting a spectrum inventory to identify non-Federal spectrum bands that can support next-generation terrestrial broadband networks. TIA believes that innovation and investment would be promoted if such an inventory were updated in real time, or as often as technologically possible.

Additionally, the Commission, in coordination with the National Telecommunications and Information Administration (NTIA), should evaluate what Federal spectrum used for terrestrial telecommunications systems may be suitable for allocation for and sharing with commercial use.¹⁶ Complementing this effort, the Commission and the NTIA should improve their spectrum management and the Commercial Spectrum Enhancement Act (CSEA) processes to reallocate spectrum in a predictable and cost-efficient manner. In order to most effectively make former Federal-use spectrum available to commercial parties in a way that will maximize that spectrum's potential public benefits, the Commission and the NTIA should enhance the CSEA's process with more transparent rules and efficient procedural efforts. Further, 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.¹⁷

In conjunction with a spectrum inventory, the Commission and NTIA should develop an automated, on-line mechanism that would facilitate spectrum sharing or clearing between incumbent and new users. This mechanism could be modeled after the online database created for the millimeter wave band that allows virtually instantaneous coordination

¹⁶ As this effort proceeds, it is important not to solely focus on the spectrum assigned to a few services (i.e., Federal, state, and local public safety entities) as the process begins to identify spectrum.

¹⁷ In evaluating spectrum availability, the Commission should consider valuable uses of spectrum beyond those of terrestrial wireless.

between incumbent Federal users and new non-Federal users in the 70-80-90 GHz bands.¹⁸

The effort to identify spectrum that can be repurposed for wireless broadband should go hand-in-hand with the Commission's ongoing efforts toward globally harmonized spectrum. Such spectrum allocations dramatically increase broadband service access and roaming capabilities, reduce manufacturing and consumer costs, and provide increased regulatory certainty regarding the future value of investments. To this end, TIA embraces the Commission's "goal of global harmonization of spectrum usage by enabling innovations that can be used both here and abroad, lessening the overall developmental costs of new and innovative technologies."¹⁹

b. Both Licensed and Unlicensed Technologies Can Increase the Benefits of Spectrum Use.

Wireless technology is critical to broadband deployment. Consumers no longer desire services that tether them to a particular location. "Anytime, anywhere" broadband services and devices are those that consumers demand. This demand can be satisfied in two complementary manners: through services and devices operating over licensed spectrum, and those operating on an unlicensed basis. TIA urges the Commission to

¹⁸ See Allocation and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands, *Report and Order*, 18 FCC Rcd 23318 (2003); News Release, NTIA, *NTIA and FCC Launch On-Line Registration for High-Speed Wireless Links Sharing Spectrum in the 70-80-90 GHz Bands* (Feb. 8, 2005). The U.S. Department of Commerce Spectrum Management Advisory Committee (CSMAC) promotes adoption of such an approach. See *Recommendations for Improving the Process for Identifying Spectrum for Future Reallocation or Sharing*, CSMAC, at 21-22 (Aug. 21, 2008); see also *Transition Report*, CSMAC, at 30 (Dec. 13, 2008).

¹⁹ See Amendment of Part 2 of the Commission's Rules to Allocate Additional Spectrum to the Inter-Satellite, Fixed, and Mobile Services and to Permit Unlicensed Devices to Use Certain Segments in the 50.2-50.4 GHz and 51.4-71.0 GHz Bands, *Report and Order*, 15 FCC Rcd 25264 ¶ 36 (2000).

support both licensed and unlicensed technology, which deliver significant public interest benefits and economic value.

Moreover, current broadband applications demonstrate the need for both licensed and unlicensed spectrum. For example, Smart Grid technology has been identified as an example of broadband technology that can potentially lead to “energy independence and efficiency.”²⁰ Smart Grid deployments do not rely solely on licensed or unlicensed spectrum, but use services and devices in both categories to meet critical needs. Smart meters, for instance, have been designed using both unlicensed and licensed spectrum. The Commission should encourage continued innovation in the broadband sector and ensure that sufficient spectrum is available for both licensed and unlicensed applications that will be used in support of next-generation broadband.

c. **The Commission Should Measure Spectrum Efficiency Within the Context of the Differences in Both Spectrum Usage and Bands.**

The Commission seeks input on how it should evaluate what spectrum is being used efficiently and productively.²¹ As the Commission assesses the uses of a given spectrum band, TIA urges the Commission to consider differences in spectrum usage. This view is detailed in the Department of Commerce’s Spectrum Management Advisory Committee (CSMAC) report on definitions of CSMAC spectrum use maximization.²² Such an approach will recognize various public benefits of a host of spectrum bands and uses.

²⁰ See American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, § 6001(k)(2)(D), 123 Stat. 115 (2009); Comment Sought on the Implementation of Smart Grid Technology, Public Notice, DA 09-2017 (rel. Sept. 4, 2009).

²¹ Spectrum for Broadband Request for Comment at 6.

²² See, e.g., Commerce Spectrum Management Advisory Committee (CSMAC), Working Group 1: Definitions of Efficiency in Spectrum Use (Oct. 1, 2008), http://www.ntia.doc.gov/advisory/spectrum/meeting_files/Spectral_Efficiency_Final.pdf (CSMAC Report) (stating that, “The determination of spectrum efficiency is not a simple matter and requires a multi-dimensional analysis involving technical and subjective considerations. An analysis based

II. FLEXIBLE SPECTRUM USE AND MARKET-BASED AUCTION RULES CAN ENSURE THE MOST EFFICIENT AND BENEFICIAL USE OF SPECTRUM.

With scarce spectrum resources, it is essential that spectrum use rules ensure the greatest spectral efficiency for licensees. Thus, the Commission should issue technology neutral licenses that enable existing and new licensees more flexibility to use innovative technologies and offer new services subject to appropriate interference regulations. Additionally, TIA urges the Commission to allocate and auction a steady stream of licensed spectrum (and acknowledges that unencumbered spectrum provides the most freedom and flexibility to deploy wireless broadband networks).²³

TIA also urges the Commission to consider adopting market-based mechanisms – such as two-sided auctions and auction vouchers – and allow licensees to assign, transfer, or lease spectrum rights based on economic and technical considerations. Additionally, TIA urges the Commission to consider using combinatorial (package bidding) auctions to facilitate optimal aggregation of spectrum. These initiatives will drive innovative wireless broadband technologies to market through effective spectrum management tools.

on a single parameter such as bit/sec/hertz will lead to erroneous conclusions for non-commercial communications systems and, in government systems used for non-communication applications, to misleading and misinterpreted results.... In some situations application requirements may cause the traditional notion of spectrum efficiency to be subservient to usage-based considerations. For communication systems any discussion of spectrum efficiency must take into account the amount of spectrum utilized, the area covered, the amount of information transmitted, and the time the spectrum is in use.”).

²³ TIA notes that, while auction based mechanisms are efficient tools for assignment of spectrum, the assignment process can take into account the public benefits that would result in spectrum being assigned via other mechanisms.

CONCLUSION.

For the reasons detailed above, TIA urges the Commission to identify and repurpose spectrum to be used by next-generation terrestrial wireless broadband, ensuring the integrity of valuable current uses in different spectrum bands, prepare for the growing demand for licensed and unlicensed devices, and structure spectrum use rules that allow flexibility in the use of the spectrum.

Respectfully submitted,

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ASSOCIATION

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