

**TESTIMONY OF CHRISTOPHER GUTTMAN-McCABE
VICE PRESIDENT OF REGULATORY AFFAIRS,
CTIA – THE WIRELESS ASSOCIATION®**

on

**MILITARY SPACE PROGRAMS AND VIEWS OF DoD USAGE OF THE
ELECTROMAGNETIC SPECTRUM**

before the

**SENATE COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES**

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TESTIMONY OF CHRISTOPHER GUTTMAN-McCABE

VICE PRESIDENT OF REGULATORY AFFAIRS, CTIA – THE WIRELESS ASSOCIATION®

Introduction

Good afternoon, Chairman Udall, Ranking Member Sessions, and Members of the Subcommittee. My name is Christopher Guttman-McCabe and I am Vice President of Regulatory Affairs at CTIA – The Wireless Association®. CTIA represents the wireless carriers, equipment vendors, and software developers that drive America's leadership in wireless broadband. Since 1984, CTIA has helped coordinate the wireless industry's voluntary efforts to provide consumers with a variety of choices and information regarding their wireless products and services. It also supports numerous industry initiatives to educate consumers and policymakers on such issues as responsible wireless technology use, the industry's eco-friendly initiatives, and accessible wireless products and services. As Vice President of Regulatory Affairs, I work on a wide range of issues involving spectrum, regulatory mandates, and homeland security. Thank you for inviting me to testify today regarding DoD usage of the electromagnetic spectrum.

The Need for More Spectrum to Drive Economic Growth

According to a 2012 report by Recon Analytics, the Nation's mobile communications industry is a significant economic engine, directly or indirectly supporting 3.8 million jobs, or 2.6 percent of all U.S. employment, contributing \$195.5 billion to the U.S. gross domestic product and driving \$33 billion in productivity improvements in 2011. As the FCC noted in its recently released Sixteenth Wireless Competition Report, the 2010 and 2011 CTIA Wireless Indices Reports indicated that incremental capital investment by wireless operators rose to \$24.9 billion in 2010, a 22 percent increase from 2009, and then increased again to \$25.3 billion in

2011. In fact, in 2012, U.S. wireless carriers invested more than \$30 billion – 25% of the world’s total wireless capital investment for the year. As CTIA also recently pointed out to the FCC, a Deloitte study shows that such continued capital investments – specifically in 4G wireless networks – could generate \$73 billion to \$151 billion in GDP growth, and create 371,000 to 771,000 jobs in America by 2016.

The industry is expected to expand as businesses and consumers increasingly rely on wireless technologies, including bandwidth-intensive smartphones, tablets, and other hand-held devices as well as machine-to-machine communications. CTIA’s most recent semi-annual survey revealed that smartphone adoption and tablet use continues to grow at dramatic rates – driving Americans’ use of more than 1.1 *trillion* megabytes of data from July 2011-June 2012, which was an increase of 104 percent over the previous year. A recent report issued by Cisco indicated that the number of mobile-connected tablets increased 2.5-fold to 36 million in 2012, and the FCC recently recognized in its Competition Report that the adoption of smartphones alone increased at a 50 percent annual growth rate in 2011. Cisco predicts that this growth will continue, with global mobile data traffic predicted to increase 13-fold between 2012 and 2017 at a compound annual growth rate of 66 percent. As the President’s Council of Economic Advisers recently reported, this explosion in wireless data usage is not only driving consumer demand for full Internet browsing, media-rich applications, and streaming video content on mobile devices, but also has the potential to facilitate significant productivity improvements in American businesses, including mobile videoconferencing, real-time remote access to inventory and sales data, and other business-to-employee and business-to-customer applications.

In order to keep pace with this growth and continue to fuel the economic engine it represents, the wireless industry needs access to more radiofrequency spectrum – the most

critical input for wireless carriers. CTIA first identified a looming spectrum crisis in 2009, when it urged U.S. policymakers to “immediately launch an effort to identify and allocate significant amounts of additional spectrum for commercial wireless services” in order to meet the demands of consumers and businesses that were, and still are, increasingly dependent on “wherever, whenever” access. As FCC Chairman Genachowski more recently noted, spectrum is the “oxygen” of the wireless industry, and “if we don’t free up more spectrum, we’re going to run into a wall that will stifle mobile innovation, hurting consumers and slowing economic growth.” While carriers have responsibly used advanced technologies to get the most out of their existing spectrum and have used unlicensed Wi-Fi spectrum to “offload” traffic from carrier networks, those efforts are simply not enough. Carriers must have access to additional licensed spectrum in order to keep up with technological developments and consumer demand.

Unfortunately, the sources of additional spectrum are limited to existing non-government users and Federal users. On the non-government side, the FCC and Congress have taken aggressive measures to free up additional spectrum. For example, in last year’s Middle Class Tax Relief and Job Creation Act, or the Spectrum Act, Congress authorized the FCC to conduct “incentive auctions” that may result in the conversion of some television broadcast spectrum for wireless broadband use. The FCC has already initiated a rulemaking proceeding to begin to implement that legislation.

On the Federal side, Congress has long recognized the importance of converting underused spectrum to commercial use. Twenty years ago, in the Omnibus Budget Reconciliation of 1993, or OBRA-93, Congress required the Secretary of Commerce to identify spectrum that could be used for commercial purposes. The Balanced Budget Act of 1997 also required the Secretary to identify additional spectrum. The Advanced Wireless Service, or

AWS, spectrum that many carriers use today was made available as a result of OBRA-93. Congress took similar action in last year's Spectrum Act, mandating that the Secretary of Commerce identify 15 megahertz of spectrum that could be converted to commercial use. The 15 megahertz in the 1695-1710 MHz band has recently been designated for such use and FCC Chairman Genachowski has said the spectrum may be auctioned as soon as September, 2014. CTIA recently urged the FCC to initiate a process to convert the 2095-2110 MHz band for terrestrial wireless use and to pair it with the 1695-1710 MHz band, pointing out that the 2095-2110 MHz band is ideally suited for mobile broadband.

However, more work is necessary to make additional spectrum available. CTIA recognizes the essential role spectrum plays for government users, just as it does for commercial entities. According to a 2011 GAO study though, the Federal government operates in approximately 70 percent of the spectrum below 3 GHz – 18 percent on an exclusive basis and 52 percent on a shared basis with non-government users. Just as it is appropriate to ensure that spectrum available to the private sector is being used efficiently and for the most highly valued services, the Federal government must evaluate the use of its spectrum and – when it can be made available for commercial operations – it should be. The President recognized the need to provide additional spectrum for broadband services and to look at Federal spectrum as part of this effort when he issued a Memorandum in June, 2010 directing the National Telecommunications and Information Administration, or NTIA, to review Federal spectrum use and provide a plan to make 500 megahertz available.

Sharing is Not the Long-Term Answer

In order to satisfy the need for additional capacity, carriers need to be able to access spectrum on an *exclusive* basis. Although the wireless industry is examining whether it can share

with Federal users on a limited basis and supports continued study of technologies that can facilitate greater and more dynamic spectrum sharing, shared use of spectrum is not a viable long-term solution. The technologies for such real-time, intelligence-based sharing are not available today, have not yet been proven effective, and will not yield the capacity required to satisfy the growing demand for broadband capacity. In addition, except for limited cases, shared spectrum is an inadequate resource because it is available only some of the time in particular places. Sweeping conclusions that shared use is the only future are therefore simply inappropriate. In the early 2000s, the wireless industry faced a similar “solution” to spectrum needs – ultra-wideband. Many people claimed that UWB devices could utilize spectrum more efficiently and that their commercial availability was “right around the corner.” Eleven years later, CTIA is glad that policymakers focused on clearing and auctioning several bands of spectrum, driving our world-leading wireless ecosystem, while still allowing the market to go forward to investigate UWB.

Sharing can be a tool to facilitate the transition of government spectrum to commercial use, but the ultimate goal should be reallocation to the extent possible. Indeed, Congress recognized as much when it directed NTIA in the Spectrum Act to “give priority to options involving reallocation of the band for exclusive non-Federal use and [to] choose options involving shared use only when it determines . . . that relocation of a Federal entity from the band is not feasible.” This preference for exclusive use has helped foster the U.S. wireless industry’s deployment of mobile broadband networks and provided tremendous economic benefits for U.S. consumers and businesses. In short, sharing is one of many available tools, and as technology advances it may provide additional opportunities for maximizing efficient use of the spectrum. Today, shared spectrum can help supplement a provider’s exclusive spectrum, but

it cannot replace it, nor does it provide the incentives or certainty necessary for carriers to make the very substantial investments needed to deliver world-leading, high quality mobile broadband services to American consumers.

The 1755-1780 MHz Band is Uniquely Suited for Commercial Use

Therefore, additional spectrum that can be used by carriers on an exclusive basis must be identified. One frequency band that would be particularly helpful in allowing wireless companies to meet rapidly expanding demand is the 1755-1780 MHz spectrum. In the United States, the band is currently used by DoD and other Federal agencies. However, the band is identified internationally for commercial mobile services and is used for that purpose throughout most of the world. Reallocation of the band would therefore harmonize U.S. allocation of spectrum with international use. The 1755-1780 MHz band is also immediately adjacent to existing domestic wireless commercial spectrum and would therefore fit seamlessly into the current mobile broadband spectrum portfolio, allowing for more immediate equipment development and deployment and facilitating easy migration of existing and developing technologies to these bands. Creating a domestic allocation that is consistent with international use will produce economies of scale and scope, making for a more robust equipment market for the band, lowering costs, and speeding implementation. International harmonization of this spectrum will also facilitate consumers' use of their wireless devices while traveling to other countries by alleviating compatibility problems.

There is broad support in the wireless industry for pairing the 1755-1780 MHz band with spectrum currently available for licensing at 2155-2180 MHz. The Spectrum Act requires the 2155-2180 MHz band to be licensed by February, 2015. The 1755-1780 MHz band should be available in the same time frame so that the two bands can be made available together. The

benefits of pairing 1755-1780 MHz with 2155-2180 MHz, which will permit alignment with existing services, facilitate faster deployment of services, provide consistency with international allocation of the band, and maximize efficient use of the spectrum, are also reflected in how the spectrum is valued. A study by the Brattle Group found that auctioning the 2155-2180 MHz band by itself would yield \$3.6 billion – but auctioned together with 1755-1780 MHz band, the pair would generate \$12 billion. Auctioning these bands on a paired basis would therefore ensure the best economic return for taxpayers, as well as the most efficient use for broadband services.

Congress Has Provided Protection for Relocating Federal Users

If the 1755-1780 MHz band is reallocated for commercial operations, Federal users of the band would be completely compensated when they are relocated from the spectrum, just as they have been in past reallocation of government spectrum. For example, the wireless industry and Federal users cooperated in the relocation of operations from the 1710-1755 MHz band so that AWS spectrum could be made available. Now, thanks to the Spectrum Act, Federal users are even better protected when their spectrum is reallocated. In that Act, Congress made important changes to the Commercial Spectrum Enhancement Act, or CSEA, which provides resources for government agencies to study relocation options and to update equipment to facilitate clearing or shared use of spectrum. In particular, the Spectrum Act allows NTIA to provide Federal agencies with compensation from the Spectrum Relocation Fund for “relocation or sharing costs” associated with the reallocation and auction of spectrum from Federal to non-Federal or shared use prior to auction. Those funds can be used for planning, equipment upgrades, spectrum sharing costs, and pre-auction planning costs associated with relocation or sharing. These

changes to the CSEA provide the resources necessary to study and implement relocation or modernization of Federal systems.

These new protections are in addition to other existing provisions which ensure that Federal operations are not harmed as a result of a reallocation of spectrum. *First*, relocation costs, which now include “the acquisition of state-of-the-art replacement systems” and which are covered by the Spectrum Relocation Fund, would be funded through the proceeds of the auction of the band to commercial licensees. *Second*, the Secretaries of Defense and Commerce and the Chairman of the Joint Chiefs of Staff would have to certify that relocation spectrum identified by NTIA and the FCC “provides comparable technical characteristics to restore essential military capability,” as required by the National Defense Authorization Act for Fiscal Year 2000. *Finally*, Federal agencies would also have the procedural protections of the CSEA, as recently amended, which requires NTIA review and approval of Federal spectrum users’ relocation plans.

These protections can result in a win-win-win for the American public, Federal users and wireless carriers. As part of the process of relocating to new systems, Federal systems, many of which are decades-old and outdated, can upgrade to the newest technology – much of which requires less spectrum to perform the same functions as existing, spectrum-intensive equipment. Purchasing state-of-the-art equipment with auction proceeds will reduce ongoing maintenance and procurement costs for federal agencies, freeing up scarce resources under current budget caps. Wireless carriers can then use the relinquished spectrum to provide services and grow the economy. All Americans will benefit in three ways – by having their government use state-of-the-art secure technology to serve the public, by the growth in the economy that more wireless broadband spectrum will produce and by having wireless systems better equipped to meet increasing demand and technological change.

Important First Steps Have Been Taken to Make the 1755-1780 MHz Band Available

I am pleased to report that the wireless industry has already been working with NTIA to examine how the 1755-1780 MHz band can be made available for commercial use. First, the FCC has issued an experimental license for the wireless industry to test the suitability of mobile broadband services in the band. As part of this effort, carriers have monitored Federal operations in the band and gathered information about the uses of the band. Those monitoring efforts are now complete and the wireless industry was able to learn more about the systems that operate in the band and the spectrum environment generally in which Federal systems operate. Wireless carriers, along with NTIA, are evaluating the information they gathered in order to decide how to proceed. The next step, as far as the wireless industry is concerned, is to conduct laboratory analysis to determine when harmful interference might actually occur. While some within the Federal government believe that only theoretical analysis is required, the success of this endeavor depends in part on the willingness of the wireless industry to invest billions of dollars to put this spectrum to commercial use. Our members would do so more confidently with more real-life tests.

Second, and in conjunction with monitoring in the 1755-1780 MHz band, members of the wireless industry are participating in Working Groups created under the auspices of the NTIA's Commerce Spectrum Management Advisory Committee, or CSMAC. Working Groups have been created to study each of the Federal systems operating in the 1755-1850 MHz band. These groups provide a forum for an exchange of technical information between Federal entities and industry regarding their respective systems and for discussion and exploration of potential solutions for relocation of Federal operations or for sharing.

Impediments to the Use of the 1755-1780 MHz Band Remain

While there has been significant discussion and cooperation between industry, DoD and other Federal entities, the current effort is insufficient to make the 1755-1780 MHz band available for commercial operations, consistent with the President's directive, in the timeframe necessary. Among other reasons, current efforts have not moved away from worst-case technical assumptions of sharing with each federal system to a more realistic analysis and interactive dialogue about what can be done by both industry and Federal agencies to make 1755-1780 MHz available in a meaningful way while meeting the needs of Federal agencies. In light of the upcoming deadline to auction the 2155-2180 MHz band, with which the 1755-1780 MHz band would be best paired, it is critical that these issues be resolved soon.

As an initial matter, tighter processes must be established by which Federal entities are required to cooperate in evaluating spectrum availability. The Spectrum Act contains specific time frames for Federal entities to act once spectrum is identified for auction. In that case, Congress realized that Federal entities should not unnecessarily delay the clearing of spectrum for commercial use. Unfortunately, there are no time frames established for cooperation prior to the time that spectrum is identified. In the current evaluation of the 1755-1780 MHz band for example, it took six months to execute a memorandum of understanding, or MOU, governing how monitoring should be conducted. Federal agencies are legitimately concerned about the dissemination of confidential information that may be produced during the spectrum evaluation process. However, that concern and the failure to develop a process that allows for productive discussion while protecting legitimately sensitive information has impeded the free flow of information and prevented evaluation or even consideration of meaningful solutions. Federal entities must be able to more quickly assess information that requires a high level of protection

while not subjecting all information exchange to the same restrictive processes. These and other steps involved in identifying and making spectrum available should be streamlined, as other aspects of the spectrum reallocation process already are based on Congressionally mandated timetables for action.

Second, Federal entities must engage in more realistic assessments of the impact of reallocation. As I mentioned earlier, in its recent evaluation of the exclusion zones necessary for commercial use of Federal spectrum, DoD has consistently made worst-case assumptions, resulting in a larger-than-necessary area within which commercial operations would be prohibited. While the wireless industry wishes to ensure that Federal operations receive the protection they need, it is not in the public interest for them to receive a level of protection unsupported by sound engineering practices. The worst-case analysis combined with a lack of dialogue regarding operational issues dooms any consideration of sharing options and results in wasted time and effort.

Similarly, NTIA's estimate of the economic impacts of relocation must be more realistic. Overstating these costs could lead to a false conclusion that the spectrum should not be reallocated, producing a missed opportunity to deliver the benefits of broadband to all Americans. In the experience of the wireless industry during the AWS relocation process, Federal entities often overestimated the time and costs of relocation. In fact, in NTIA's Fifth Annual Report on the AWS spectrum relocation process, it reported that the DoD (in particular, the Navy) returned over \$51 million dollars back to the Treasury. NTIA's current estimated costs for relocating systems from the entire 1755-1850 MHz band is \$18 billion, but DoD earlier estimated that it would cost only \$4.6 billion to clear the entire band. There must be a more reliable review of the costs for relocating Federal users.

Finally, NTIA must begin to focus on the 1755-1780 MHz band in particular, not the broader 1755-1850 MHz band. FCC Chairman Genachowski has already announced that the FCC may auction that spectrum as early as September, 2014. However, current efforts to make that spectrum available are at an impasse because of an insistence that a complete solution be developed for the entire 1755-1850 MHz band before any decision is made with respect to the 1755-1780 MHz sub-band. The current course will fail to develop a solution in the time required to auction 1755-1780 MHz paired with 2155-2180 MHz and will result in missed auction revenue and a missed opportunity for Americans to benefit from greater access to broadband. While 1780-1850 MHz is desirable spectrum, there are no immediate plans by industry to make use of the band. In contrast, the 1755-1780 MHz band is uniquely valuable because, among other things, of the pairing opportunity with 2155-2180 MHz. The 1780-1850 MHz portion of the band has no such immediate pairing opportunity. Because 1780-1850 MHz is situated between two uplink bands – bands used for transmitting from user devices to the base station – it would also be most effectively used as additional uplink spectrum. However, it would require a corresponding downlink band – a band used for transmitting from base stations to user devices – to be useful. Because a matching downlink band is not available today, the value and use of 1780-1850 MHz is currently limited.

Additionally, in assuming that the entire 1755-1850 MHz must be relocated now, DoD has focused on the 2025-2110 MHz band as replacement spectrum. That band would be valuable as commercial downlink spectrum, like most of the 1930-2200 MHz band in which it is located. While not the same as paired spectrum, downlink spectrum can be effectively used without a corresponding uplink. It is therefore unlike the 1780-1850 MHz band, for which there is no current need, which is best used for uplink but for which there is no paired spectrum available.

Accordingly, it would not be sound spectrum policy to relocate Federal systems out of the 1780-1850 MHz band now to another band like the 2025-2110 MHz band.

Rather than continue down the current course of studying reallocation of the entire 1755-1850 MHz band, efforts should be focused on reallocation of the 1755-1780 MHz sub-band in the near-term. Sharing or relocation studies for the 1780-1850 MHz band should continue, in accordance with Federal requirements and long-term technology upgrades. However, near-term action to auction the 1755-1780 MHz band paired with 2155-2180 MHz will relieve the growing pressure for spectrum, while allowing Federal agencies reliable access to 1780-1850 MHz for at least ten years.

With a focus on 1755-1780 MHz, additional Federal assignments in that band should not be permitted. In addition, Federal agencies should be required to provide reliable estimates for clearing the 1755-1780 MHz band, not the entire 1755-1850 MHz spectrum. NTIA's Fifth Annual Report, for example, examined the entire 1755-1850 MHz band. NTIA did not provide estimates for relocation of just the 1755-1780 MHz band. While reallocation of the entire band may ultimately be desirable, the immediate focus should be on 1755-1780 MHz.

NTIA has consistently asserted that the 1755-1780 MHz band is difficult to reallocate because of the operations located through the entire 1755-1850 MHz band. It should, however, determine the operations that operate uniquely in the 1755-1780 MHz band in order to better assess operations that must be relocated. Systems that operate throughout the 1755-1850 MHz band can use other parts of the spectrum unless NTIA demonstrates why that is not feasible. Relocating those systems from the 1780-1850 MHz band can be part of a longer-term evaluation of spectrum reallocation.

Conclusion

CTIA and its members support exploration of spectrum sharing with Federal users but believe that sharing is not the long-term answer. To the contrary, in order to create certainty and to incentivize wireless carriers to make investments that will benefit the American economy and consumers, the ultimate focus should be on reallocation of spectrum to carriers on an exclusive basis. To that end, the 1755-1780 MHz band, coupled with the 2155-2180 MHz band that is already available for licensing, is ideally situated for commercial use. However, cooperation between Federal and non-federal users is necessary to achieve the benefits that would result from commercial use of these paired bands. Congress has made important changes to Federal law in order to provide economic and procedural protections to Federal users as they are relocated. At the same time, tighter processes must be established to ensure that Federal users do not unnecessarily delay this consideration or otherwise engage in unrealistic assessments that may impede reallocation. This cooperative approach, along with an increased focus on the 1755-1780 MHz band specifically, will allow the wireless industry and Federal users to develop a plan that fully utilizes scarce resources in order to meet the mounting demand for additional wireless broadband capacity.

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Thank you again for the opportunity to appear before you today. CTIA appreciates this Subcommittee's continued focus on this important issue and looks forward to working with this Subcommittee, Congress, NTIA, DoD and the FCC on these issues.