

NOT FOR PUBLICATION UNTIL RELEASED BY THE HOUSE ENERGY AND COMMERCE COMMITTEE,  
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY

**STATEMENT OF  
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**BEFORE**

**THE HOUSE ENERGY AND COMMERCE COMMITTEE  
SUBCOMMITTEE ON COMMUNICATIONS AND TECHNOLOGY**

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## **Introduction**

Good morning Mr. Chairman and distinguished Committee members. Thank you for the opportunity to testify before the Committee regarding the vital importance of scarce radio frequency spectrum to U.S. national defense capabilities, the economy, and consumers, especially during these challenging budget times. I am Teri Takai, and I am the Department's Chief Information Officer (CIO). I am responsible for ensuring that DoD information and information technologies can be depended upon in the face of threats by a capable adversary in all conditions from peace to war. Spectrum plays a critical role in that regard. My testimony today will focus on the importance of spectrum to the Department of Defense (DoD) in ensuring that our warfighters and mission partners have the critical capabilities they need to prepare for and execute the missions assigned to them by the Commander in Chief as safely and effectively as possible.

## **Importance of Spectrum to DoD**

The DoD remains fully committed in support of the national economic and security goals of the President's 500 MHz initiative to make spectrum available for commercial broadband use, the implementation of more effective and efficient use of this finite radio-frequency spectrum and the development of solutions to meet these goals while ensuring national security and other federal capabilities are preserved. Spectrum has become increasingly important to the Department's missions, consumers, and the economy of the nation as a whole.

Military spectrum requirements are diverse and complex given the variety of different missions the Department must support around the world. DoD uses spectrum for command and control operations, communications, intelligence, surveillance and target acquisition, on land, at sea, in the air and in space. In the United States, our systems utilize spectrum in order to properly train as we must fight. In short, spectrum is the critical enabler that ensures information is dependably available to train our forces and ensure safe and successful mission accomplishment.

The Department, like the rest of the country and world, also has growing requirements resulting from our increasing reliance on spectrum-dependent technologies. An example is the Department's use of unmanned aerial systems (UAS) requires spectrum to process volumes of

critical intelligence, surveillance and reconnaissance data in support of our missions in military areas of operation. Our inventory of UAS platforms has increased from 167 in 2002 to nearly 7,500 in 2010. This has resulted in a dramatic increase in UAS use and training requirements, and consequently an increase in demand for spectrum to adequately satisfy those missions.

While the Department critically depends on wireless and information technology that require spectrum, DoD is cognizant of the scarcity of this resource and its importance to the economic well-being of our nation. When referencing the United States Frequency Allocation chart, and using the strict interpretation of the allocations, one will find in spectrum between 225 and 3700 MHz 18% federal exclusive use, 33% non-federal exclusive use, and 49% federal/non-federal shared use. Within spectrum allocated for exclusive federal use, the majority of the spectrum is shared between DoD and all of the other federal agencies, across a wide array of systems, performing a multitude of varied missions, often with very different technologies.

As noted above, the Department also recognizes the importance of the growing needs for spectrum for economic development, technology innovation and consumer services. Within the DoD, we understand that the strength of our nation is rooted in the strength of our economy in harmony with the strength of our national security. We are dependent on industry for innovative products that can be used for national security.

The Department continues to work with the National Telecommunications and Information Administration (NTIA), other Administration partners, and industry to develop the information required to ensure balanced spectrum repurposing decisions that are technically sound, operationally viable from a mission perspective and economically prudent. The results so far have been promising. For instance, in support of the President's 500 MHz initiative, the initial frequency band assessment, commonly referred to as the "fast track study," resulted in arrangements to geographically share the 1695-1710 and 3550-3650 MHz bands. The reallocation feasibility assessment of the 1755-1850 MHz band also marks another important step. NTIA concluded in its assessment report that while there are significant challenges yet to overcome, including high cost and long timelines, it is possible to repurpose all 95 MHz of spectrum, based on the conditions outlined in the report. DoD is fully engaged in addressing these challenges, by closely working with industry to evaluate sharing possibilities and is open to

other options that would benefit the economy and fulfill DoD's mission needs.

In general, in order to avoid critical mission impacts and maintain comparable capability, there are three things the DoD requires if we are to relocate our systems out of spectrum to be repurposed for wireless broadband; cost reimbursement, sufficient time, and, if necessary, alternative spectrum with comparable technical characteristics to restore essential military capability that will be lost when the band of frequencies is surrendered (note Public Law 106-65. The costs to modify or replace existing systems to use the identified comparable spectrum (e.g., 2025-2110 MHz, 5150-5250 MHz) were included in the analysis. NTIA report shows total cost for all federal agencies is about \$18 billion, approximately \$13 billion is DoD's cost. The timeline to relocate systems from the 1755-1850 MHz band is dependent upon the schedule of developing and deploying comparable capabilities, and can vary from a few years for simple systems with readily available alternatives, up to 5-10 years for more complex systems, and upwards of 30 years for space systems, where modification is not an option. Recognizing the relocation challenges, the focus has shifted to spectrum sharing as a potential option for repurposing spectrum bands for commercial wireless broadband use.

The Department has and is continuing to work with NTIA and the Federal Communications Commission (FCC) to determine ways to share spectrum with commercial broadband users when possible. Recent successes include the FCC's new rules which allow Dish networks to roll out a Broadband network across the country in the 2180-2200MHz band adjacent to the 2200-2290MHz band that is critical to our satellite communications downlink and aeronautical mobile telemetry testing, yet collectively DoD and Dish were able to establish the rules to permit this new use to enter the band without risk of harmful interference. We are also working with the FCC and NTIA to explore ways to increase commercial access by sharing the 3550-3650MHz band and enable sharing in the 5GHz bands as well for commercial broadband use. To date we have identified 405MHz of spectrum for potential commercial broadband use.

While large-scale spectrum sharing between federal systems and commercial licensed cellular broadband services presents new challenges, DoD is committed to working with government and industry partners to develop equitable spectrum sharing solutions. DoD is actively supporting efforts through NTIA-established working groups (WGs) under its Commerce Spectrum

Management Advisory Committee (CSMAC) to further the 1755-1850 MHz band assessment, working with interagency partners, NTIA, FCC and industry. In spite of the information sharing challenges within the CSMAC WGs construct, DoD took on most of the analysis in order to progress the work to determine the best possible solution to repurpose the 1755-1850 MHz band. DoD has completed and provided the results to the WGs. DoD has also provided the details of the analysis to NTIA and the FCC for validation. As everyone recognizes, information sharing continues to be challenge, but DoD is working closely with NTIA, the FCC, and industry to develop viable methods to share controlled unclassified information with respect to the 1755-1850 MHz band. In fact, DoD recently met with NTIA and industry representatives and came to an agreement on an approach to share information with industry selected participants in the CSMAC working groups. Industry has provided us with answers to questions posed by DoD and we have developed and signed non-disclosure agreements to make this happen immediately. We are currently waiting on industry to sign the agreements.

The outcome so far from the CSMAC WGs evaluation have been very useful to finding long term solutions, although the final reports have not been completely finalized. The main focus of the evaluation is to determine the feasibility of sharing the entire 1755-1850 MHz band versus relocation, with the exception of the video surveillance systems, which are addressed under WG-2 and have been determined not to be compatible with the commercial mobile wireless broadband systems and, therefore, must relocate. WG-3 is showing promising results that sharing between federal satellite operations and commercial mobile wireless broadband is feasible. WG-4 is addressing Tactical Radio Relay, Software Defined Radios, and Fixed Point to Point Microwave systems and is showing the need for some sharing, some relocation and some systems may be able to operate above 1780 MHz with assured access to comparable spectrum. WG-5 which addressed federal airborne systems is the most challenging, not surprisingly, as sharing between federal airborne operations and commercial mobile broadband would require significant distance separations to preclude interference. Currently, DoD is unaware of commercial technologies that would allow airborne systems to share this spectrum band with commercial mobile devices without extensive exclusion zones. Therefore, it is likely that DoD will have to pursue options to relocate or modify the channelization of equipment, while maintaining essential capabilities. .

WG-1 addressed a different band, 1695-1710 MHz, and arrived at equitable sharing arrangements with refined results that greatly improved the ‘fast track analysis’ with respect to sharing between federal weather satellite receivers and commercial wireless broadband systems (LTE technology specifically). This is a positive outcome that enables DoD and other federal agencies to start developing transition plans in order to meet the congressional mandated auction timeline for this band.

DoD has also been cooperatively working with three major wireless providers to evaluate sharing the 1755-1850 MHz band, including allowing the wireless providers on selected DoD sites to monitor the spectrum, as well as modeling, simulation and analysis to develop an understanding of the sharing environment. The group has completed the monitoring phase, and DoD continues to work with industry to fully define the modeling simulation and analysis phase activities.

All of these efforts are examples of an unprecedented collaboration between the DoD and the commercial industry to assess highly complex technical issues with a goal of ensuring practical and balanced spectrum repurposing decisions that are economically viable, technically sound and operationally viable from a mission perspective.

Let me also address the issue of the lower 25 MHz or the 1755 – 1780 MHz band. We fully understand the desire to bring this 25 MHz to market rapidly, particularly with a potential pairing band called out for auction within three years in the Middle Class Tax Relief and Job Creation Act. However, the Department has some significant reservations, including with FCC notification to NTIA to auction the band as early as September 2014. As we worked within NTIA’s established process to identify the 500 MHz directed by the President, the federal agencies, including DoD, were instructed to study reallocation of the entire 95 MHz band. Thus, a detailed study of vacating solely the lower 25 MHz has not been conducted, and the results of the full 95 MHz band study cannot be extrapolated to a solution for just the lower 25 MHz for many systems. Further, DoD would like to understand the long term status of the full band as part of any decision on the lower 25 MHz, in order to fully understand the impacts on DoD warfighting missions and cost implications of any relocation.

In order to make balanced decisions about relocating from or sharing the 1755-1850 MHz band

or any other spectrum, the Department requires adequate time to conduct operational, technical, cost and schedule-feasibility analysis to ensure national security and other federal capabilities are preserved, while supporting the economic benefits spectrum use affords the nation. These studies are critical to preserving the warfighting advantages our weapons systems provide so that our soldiers, sailors, airman and marines can perform their missions with the greatest possible advantage over our adversaries, and return home to their loved ones safely. For example, in evaluating alternative proposals for the 1755-1850MHz band, we must consider whether they overstate DoD's ability to compress, or understate the need for comparable spectrum and cost reimbursement. Further, without these assessments to inform clear plans and guidance, including where Federal systems will move to, it is difficult for Federal agencies to develop transition plans that would enable auction and reallocation of spectrum.

Based on all the analysis that has been done thus far, it is clear that complete relocation or total compression of federal operations into the 70 MHz between 1780-1850 MHz have major challenges associated with them. None of the analyses conducted thus far (by NTIA, the Federal Agencies, or CSMAC WGs) has assessed full compression into the upper 70 MHz, 1780-1850 MHz, both assessments provide great insight as to what challenges would be expected if compression of federal systems without proper accommodation is attempted. The NTIA assessment showed some ground systems can transition out of the 1755-1780 MHz band within 5 years as a transition step to relocating out of the entire band in 10 years. However, some major airborne systems (e.g., ACTS, AMT) could not transition out of the lower 25 MHz in many major commercial market areas due to significant separation distance requirements. In turn, eliminating use of 25 MHz without accommodation of alternative spectrum to move to would result in loss of capabilities for DoD and adverse operational impact.

In addition, the assessments undertaken so far highlight the fact that a realistic and balanced solution for the spectrum challenges we face will likely include a combination of sharing, relocation, and some compression. DoD believes that any solution, however, will require access to comparable spectrum and funding. From a DoD perspective, an approach that considers a combination of strategies to assess the 25 MHz and that takes into account national security and economics could reduce the total relocation costs for Federal agencies and lessen demands for comparable spectrum.

DoD recognizes the need to look forward. The Department is developing a spectrum strategy focused on investing in technologies and capabilities aimed at more efficient use and management of spectrum, and for increased interoperability with our Coalition partners and with Federal, State, and commercial entities.

### **Summary**

The ability to have assured access to spectrum in order to operate spectrum-dependent national security capabilities without causing and receiving harmful interference while understanding the critical needs of our Nation's economy remains paramount to the Department. The federal government and our industry partners have built an impressive team that is working toward solving the technical and policy issues so we can move ahead. Together, we will develop long-term solutions to achieving a balance between national security spectrum requirements and meeting the expanding demand of commercial broadband services.

I want to thank you for your interest in hearing the importance of spectrum to DoD and I am happy to answer any questions you may have.