**Before the**
**FEDERAL COMMUNICATIONS COMMISSION**
**Washington, DC 20554**

In the Matter of

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| Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands – Notice of Proposed Rulemaking and Order on Reconsideration | ) ) ) ) ) ) | GN Docket No. 13-185 |

To: The Commission

# COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION


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## COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

The Telecommunications Industry Association submits these comments on the Notice of Proposed Rulemaking and Order on Reconsideration ("NPRM") in the above captioned proceeding.[1] TIA represents the global information and communications technology ("ICT") industry through standards development, advocacy, trade shows, business opportunities, market intelligence and world-wide environmental regulatory analysis. For over 80 years, TIA has worked to expand access to information and communications technologies, including broadband, mobile wireless, cable, satellite, and unified communications networks. TIA members manufacture the equipment used for the deployment of broadband services, as well as the devices used by consumers to access these services. TIA is accredited by the American National

[1] Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands - Notice of Proposed Rulemaking and Order on Reconsideration, GN Docket No. 13-185 (rel. July 23, 2013) ("NPRM").

Standards Institute ("ANSI"). As discussed below, TIA offers its supportive input regarding the Commission's NPRM of the AWS-3 bands.

## I. INTRODUCTION AND SUMMARY

TIA, a leading trade association for the ICT industry, is a strong supporter of the Commission's efforts to realize the full potential of mobile communications. With America's use of mobile connectivity growing, TIA shares the concerns expressed by many of the need to address the "spectrum crunch," as the demand for mobile applications exceeds available capacity.

Radio spectrum has never before been more important. In commercial communications networks, mobile data use is exploding as consumers embrace smartphones, tablets and other devices. Wireless connectivity is becoming the way in which consumers access the Internet from technologies such as LTE and Wi-Fi. In addition to commercial uses, the Federal Government places demands on spectrum for communications, sensing, radar and other uses across a wide variety of agencies, and to achieve a diverse set of missions unique to government. Moreover, radio technologies themselves are changing, placing new demands on traditional spectrum allocation approaches. As a result of these dynamic changes, spectrum allocations and uses that met the country's needs during the 20th century are increasingly under stress.

Because US policymakers are no longer writing spectrum policy on a blank sheet of paper, and virtually all usable spectrum is allocated, TIA believes that a national spectrum policy must reflect the following principles to allow the nation's use of radio spectrum to evolve to meet changing demands and enable new technologies:

(1) Spectrum allocations need to be predictable – identifying demand and changes in demand, understanding the pace of radio technology development by platform, and planning for the long term are all part of a spectrum policy plan that can support predictability for both commercial and government uses;

(2) For commercial allocations, flexible use policies consistent with baseline technical rules that are technology-neutral have proven to be the best policy;

(3) Policies should encourage more "efficient use" of spectrum, recognizing that there is no one size fits all definition;[2] and

(4) Policies should recognize that some existing radio platforms, such as commercial mobile, today depend upon geographically cleared spectrum, while emerging radio technologies may be able to share with other like or unlike radio technologies. In cases where sharing is possible, policies must advance good engineering practice to best support an environment that protects those with superior spectrum rights from harmful interference.

[2] Recognizing that no single metric of spectrum efficiency exists, TIA notes the final product of the Commerce Spectrum Management Advisory Committee (CSMAC), "DEFINITIONS OF EFFICIENCY IN SPECTRUM USE" (Oct. 1, 2008), *available at* http://www.ntia.doc.gov/files/ntia/publications/spectral_efficiency_final.pdf (accessed September 13, 2013).

## II. AMERICA'S SPECTRUM SHORTAGE

America's use of mobile connectivity is growing exponentially. This increased demand for capacity-intensive access to the Internet is visible with the rapid growth of smartphone adoption. These devices are essentially handheld computers integrated with a mobile telephone, allowing consumers to use them in much the same manner as their home computers. With smartphones replacing feature phones, the growth in the smartphone universe is straining available wireless spectrum. In 2012, wireless subscribers for the first time spent more on data than they did on voice. Spending on data rose by a third in 2012, and during the next four years it will increase by 94 percent. TIA projects that the overall wireless market, including voice and data services, wireless handsets, wireless infrastructure equipment, and services in support of the wireless infrastructure, will expand at a 7.6 percent compound annual rate, reaching an estimated $364.5 billion in 2016 from $272.3 billion in 2012.[3]. Innovation and growth have also gone well beyond the smartphones. Demand for bandwidth consuming devices such as netbooks and tablets are skyrocketing.

[3] This data, as well as all other projections and statistics provided in this document which are not cited to otherwise, are derived from the TIA *2013 ICT Market Review & Forecast*, a proprietary annual publication from TIA containing distilled data and analysis on information and communications technology industry trends and market forecasts through the end of 2016. This document is available for purchase at http://www.tiaonline.org/resources/market-forecast.

## III. BROAD SPECTRUM ALLOCATION PRINCIPLES

The Commission can ensure enhanced use and value to the AWS-3 bands. TIA appreciates that these principles reflect broad aspirations and that inevitably they must be tempered by the context of the reality of existing spectrum uses. Nevertheless TIA applauds the Commission for the very significant extent to which the NPRM's proposals are consistent with these principles.

### *A. WIRELESS BROADBAND SERVICES ARE BEST PROVIDED UTILIZING WIDE AND CONTIGUOUS SPECTRUM*

Priority should be placed on allocations of wide, contiguous blocks of spectrum. Narrower allocations raise product development costs by requiring separate efforts in each portion of the spectrum and result in non-technology neutral polices, lead to limited product availability for consumers, and increase the time-to-market period. [4] In short, the adverse consequences reduce innovation to the detriment of the consumer and limit quality of service.

High data rates need wider bandwidth. The most proficient performance of LTE requires wider bandwidth channels because larger and wider channels will result in more efficient and effective networks, and will facilitate heightened deployment of Long Term Evolution (LTE).[5] The Commission should prioritize the allocation of wide, contiguous blocks of spectrum. Such

[4] *See, e.g.*, 47 C.F.R. § 24.229 (identifying some Broadband PCS blocks of 5 MHz); *Id.* at § 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).

[5] *See* ITU-R, Report M.2134, Requirements related to technical performance for IMT-Advanced radio interface(s), Approved in Nov 2008 http://www.itu.int/pub/R-REP-M.2134-2008/en.

provisions help avoid the difficulties associated with fragmentation and encourage the use of wide-bandwidth technologies.

### *B. ADJACENCY TO LIKE SERVICES*

TIA concurs with the Commission's support for allocations that are adjacent to like services. This will reduce the potential for interference to and from adjacent allocated services and promote the benefits of wider, contiguous blocks which will also reduce deployment costs, speed standard development, and encourage the deployment of 4G technologies.

When two similar wireless broadband services are adjacent to each other, they experience the benefits of contiguous bands noted above. Furthermore, adjacency to like services reduces interference concerns to or from services allocated in adjacent bands. An additional benefit includes reductions in deployment costs for networks and equipment providers. Moreover, the standard development process is accelerated, as existing equipment can be modified rather than requiring new technology developments to support other bands; this acceleration speeds products to market.

Consequently, TIA advocates avoiding reliance on aggregating widely separated blocks of spectrum through technological means, because large contiguous blocks make radio implementations tractable and ensure that a majority of customers can be covered with practical deployments.[6] Using widely separated spectrum blocks may require extensive filtration, adding cost, size, and complexity.

[6] *See, e.g.*, Comments of TIA, ET Docket No. 10-123 (filed Apr. 22, 2011) at 4-6 ("TIA Broadband Spectrum Comments").

### *C. SEPARATION FOR UPLINK AND DOWNLINK FREQUENCY BANDS*

A lack of separation between the uplink and downlink frequency bands can pose significant interference issues,[7] and the potential for harmful interference to the services in these bands would also create considerable uncertainty in the marketplace.

### *D. GLOBALLY HARMONIZED SPECTRUM ALLOCATIONS*

TIA endorses the use of bands that are globally harmonized. In many cases, international studies are developed for specific bands, taking adjacent uses into account. This aids in regulatory compliance, allows for easier management of cross-border interference with U.S. neighbors, and encourages global roaming.

[7] *See, e.g.*, Janis, Pekka, et al, *Adjacent channel interference between asynchronous TDD cellular networks* (Sept. 2004), *available at* http://202.194.20.8/proc/VTC09Spring/DATA/09-04-04.PDF (noting that "the interference between the uplink and downlink transmissions within each operator band as well as among the operators can generate extremely high interference…").

## IV. ENHANCED FEDERAL & NON-FEDERAL SPECTRUM SHARING AND COORDINATION

### *A. THE NTIA COMMERCE SPECTRUM MANAGEMENT ADVISORY COMMITTEE (CSMAC)*

The Commerce Spectrum Management Advisory Committee ("CSMAC") and five subordinate Working Groups comprised of industry and government stakeholders explored spectrum sharing arrangements during the past year. While the working groups contained technical experts familiar with specific bands and their uses, direct interaction was significantly constrained. A majority of the CSMAC members stated: "..because only limited technical data was shared about Federal systems with the working groups, participants were not able to fully engage in the type of informed discussion of the analysis and underlying assumptions necessary to verify the accuracy of the information."[8]

Their statement regarding the reports of Working Groups 3, 4 and 5 concluded that they were "in no way endorsing the assumptions and methodologies that went into the analysis. Initially, the analysis performed in each of these working groups was both conservative and limited. We believe that additional efforts should be initiated that would greatly mitigate the protection zones for Federal operations including, but not limited to, considering other effects such as clutter, more reasonable interference protection limits and considering a more representative LTE system model. We believe that many of the current analysis results do not

[8] *See* "Separate Statement Concerning Working Group Reports for the 1755-1850 MHz Band Rev 1" available at http://www.ntia.doc.gov/files/ntia/publications/csmac_separate_statement-aug_29-rev2.pdf (accessed September 13, 2013) ("Dombrosky Statement").

represent the real-world interference environment between Federal and commercial users." [9] Further efforts are essential in order to develop realistic representations of the interference environment between Federal and commercial operations. Indeed, associated with this CMAC process has been encouraging indications of potential future avenues of cooperation with the Department of Defense.[10]

TIA believes, though, that the unprecedented CSMAC Working Group process was a beneficial first step toward and catalyst in developing a better understanding of the technical characteristics of Federal and commercial systems. Also encouraging is the "trusted agent" process recently initiated, which will allow the release of more detailed Federal system technical characteristics to industry representatives signing non-disclosure agreements. This enables commercial parties to model improved analyses, while avoiding unnecessary public release of unquestionably sensitive technical characteristics of our military systems. [11]

### *B. COORDINATION AMONG USERS*

As the NPRM notes "..NTIA intends for its CSMAC process to generate actionable recommendations regarding non-Federal access to these bands."[12] The successful completion of this process is critical. Toward that end, TIA regards as essential that appropriate mechanisms for

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9 *Id.*

10 *See,* Letter from Teresa M. Takai, Chief Information Officer, Department of Defense, to the Honorable Lawrence E. Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration, at 1 (July 17, 2013), *available at* http://apps.fcc.gov/ecfs/document/view?id=7520932630.

11 *See* Dombrosky Statement.

12 *See* NPRM at ¶53

the sharing of sensitive information be fully implemented. The interests of all stakeholders are best served by better communications, both from avoiding possible interference, but also from maximizing spectrum valuation for private uses. Beyond this enhanced sharing of technical information, the development of robust coordination and enforcement mechanisms at a technical level that can address issues that arise from the shared use of bands is equally necessary to create a two-way sense of trust. Although the Commission has experience with spectrum coordination among private users, the coordination among non-Federal and Federal presents additional challenges.

## V. BAND-USE CONFIGURATION & TECHNICAL RULES

### *A. PROPOSED BAND PAIRING*

In general, TIA supports the Commission using technical rules that are identical or similar to AWS-1. The pairing of AWS-3 spectrum with Frequency Division Duplex (FDD) spectrum that is contiguous and compatible will maximize its efficient use and value. Additional bandwidth for downlink use in asymmetrical pairing is significantly more useful than the reverse.

#### 1. 1755-1780 MHz

TIA supports pairing 1755-1780 MHz with 2155-2180 MHz and using the same technical rules as AWS-1.

Despite a broad national consensus for making more spectrum available, four and a half years after the National Broadband Plan came out; only limited progress has been made toward this goal. A protracted proceeding over AWS-3 would delay availability further. To the extent that the complexities in the other bands under consideration may delay action, the Commission should consider bringing the 1755-1780 MHz / 2155-2180 MHz band to market first.

### 2. 1695-1710 MHz

TIA supports the use of this block for uplink spectrum as it is contiguous to the current AWS uplink spectrum. To maximize the commercial wireless industry's use of this spectrum it would be paired with 2095-2110 MHz for the downlink. However there are significant challenges to providing access to the 2095-2110 MHz band, given the use of this spectrum by NASA's Tracking and Data Relay Satellite System and similar satellite systems operated by other administrations. Moreover, it has been identified as part of the "comparable spectrum" for DOD to be able to move operations from the 1755-1850 MHz band.

However alternative spectrum approaches present significant challenges as well. For example, a second option might be to pair 1695-1710 MHz with the 2000-2020 MHz band for the downlink. This would allow the 2000-2020 MHz block to be combined with 2020-2025 MHz as downlink which would be much more useful than additional uplink spectrum. Splitting Band 23 would also provide paired downlink spectrum for the 1780-1800 MHz block. Although this alternative might better align the uplink/downlink spectrum which may otherwise require a guard band, having a band with 15 MHz of uplink and 25 MHz of downlink without the need for a

guard band would support current asymmetrical traffic. This option presents additional challenges, among them the adjustments that would be required of the Band 23 incumbent, including having to employ different duplex spacing and filters.

The further options of standalone uplink or time division duplex (TDD) would make very inefficient use of this block of spectrum. The current demand and expected future demand is for additional downlink spectrum, therefore it is difficult to imagine how this block would be used as standalone.

### 3. 2020-2025 MHz

The spectrum block presents several options, including possible use as alternate spectrum for the current users of the 2095-2110 MHz, in the event that that band is cleared.

Alternatively it could be added to the 2000-2020 MHz in the current uplink configuration. However, to the extent that additional downlink spectrum is preferable in light of current traffic patterns, using 2020-2025 MHz for downlink would be more desirable.

This presents a third option of using the block as downlink spectrum, with both paired with 1695-1710 MHz.

### 4. 1780-1850 MHz

Although the NPRM acknowledges the existing constraints on making this band for non-public uses, the Commission notes both that industry “has not dismissed the possibility of seeking access to this spectrum in the long-term” and that “NTIA reports that it appreciates the

Commission's "recognition of the potential need to address rules to accommodate the phased relocation of the entire 95 megahertz of the 1755-1850 band." [13]

However TIA notes the conclusion of the "Industry Roadmap" for this band which concedes "the legitimate requirements of Government operations, including the need for systems to have long term access to the 1780-1850 MHz band if other spectrum is not available for relocating those systems." [14]

## VI. LICENSING AND OPERATING RULES; REGULATORY ISSUES

As previously stated, TIA supports the Commission's proposed extension of a successful AWS-1 environment to AWS-3. The AWS-3 proposal reflects the widely-held spectral efficiency principles that TIA has long advocated. 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.

Rather than deviating from the AWS-1 power rules for the 1695-1710 MHz and 1755-1780 MHz bands, TIA would apply the same standard for this band as well. [15]

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[13] *See* NPRM at ¶¶36, 37

[14] *See* Letter from Steve Sharkey, T-Mobile U.S., Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket Nos. 10-123, 07-195 (dated Jun. 24, 2013), ("*Industry Roadmap") available at* http://apps.fcc.gov/ecfs/document/view?id=7520924790 (accessed September 13, 2013).

[15] *See* NPRM ¶ ¶ 99-103

TIA cautions against attaching conditions to auctions that may either devalue the spectrum proceeds or ownership restriction which could delay build outs. TIA strongly supports permitting flexible use and secondary uses. The policy objective of incentivizing early deployment can be accomplished by promoting leasing arrangements to allow for efficient utilization and allowing common carrier, non-common carrier arrangements.
Consistency with leasing rules that apply to other terrestrial spectrum is a virtue, and helps ensure that future transactions can proceed with greater predictability and transparency. This policy will create regulatory certainty and encourage innovative arrangements that can speed wireless broadband to rural and other areas through innovative partnerships for expansion of wireless broadband coverage areas.

The Commission should 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.

## VII. CONCLUSION

For the foregoing reasons, we urge the Commission to adopt policies consistent with the above recommendations.

Respectfully submitted,
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By: ___/s/_____

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