Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U–NII) Devices in the 5 GHz Band	)	ET Docket No. 13-49
	)	
	)	

COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

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May 28, 2013

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EXECUTIVE SUMMARY

TIA applauds the Commission for framing the *NPRM* to not only satisfying Congress' mandate that a proceeding be commenced to consider allowing U–NII devices to operate in the 5350-5470 MHz band, but to holistically confront a wide range of questions regarding the future of unlicensed use of the 5 GHz band. Identifying and implementing the right answers to those questions, some of which are likely to prove quite challenging, is of critical importance not only for manufacturers of U–NII equipment, but also for the millions of American consumers, enterprises, and service providers that are increasingly dependent upon 5 GHz unlicensed technology to meet their wireless communications needs.

America is experiencing an exploding demand for wireless data connectivity that cannot possibly be satisfied by licensed spectrum alone. By making available the large swath of contiguous spectrum that can be provided for U-NII at 5 GHz on a technology-neutral basis, the Commission can facilitate the provisioning of the multi-gigabit throughput that is needed to support advanced applications, as well as optimizing a more efficient channel arrangement. Technologies already are being introduced for unlicensed use that reach unprecedented throughput per second based on the wider channel bandwidths that can be achieved at 5 GHz. One such technology is the next generation of Wi-Fi, IEEE 802.11ac, which allows a significant increase in data rates by empowering wider channel bandwidths than prior Wi-Fi standards, and is designed to take maximum advantage of the large contiguous 5 GHz band that would be created in the United States by designation of the 5350-5470 MHz and 5850-5925 MHz bands for U-NII use. Or, under the technology-neutral approach TIA advocates, allowing U-NII use of additional 5 GHz band spectrum could provide capacity for data offload by heterogeneous networks, particularly in urban areas, airports, stadiums and similar area where congestion is a growing concern. For these reasons, TIA strongly supports the expansion of unlicensed access to the 5350-5470 MHz and 5850-5925 MHz bands on a technology-neutral basis that encourages continued innovation, technological development, and investment. Such expansion, however, must be accomplished in a manner that affords suitable protections for incumbents.

In addition to creating the U-NII-2B and U-NII-4 bands, the Commission can and should take appropriate measures necessary to address the problem of interference by outdoor U-NII deployments to TDWR systems. Throughout the 5 GHz band, the Commission should seek to foster coexistence of incumbent systems and unlicensed technologies, while at the same time minimizing the potential for congestion among U-NII users. As a general proposition, TIA supports the harmonization of the Commission's power, emissions and indoor/outdoor use rules across all of the 5 GHz U–NII bands, but recognizes that it will be necessary to adopt specialized provisions for particular sub-bands to provide appropriate protection to incumbents.

Commission leadership will be critical to the successful and prompt completion of the ambitious agenda for the 5 GHz set forth in the *NPRM*. Several of the issues raised by the *NPRM* have been the subject of extensive study by the Commission, other governmental stakeholders and industry over the course of several years and appropriate changes to the 5 GHz rules and implementing procedures can be adopted quickly. On the other hand, some of the issues, particularly those involving the establishment of the U-NII-2B and U-NII-4 bands, present novel challenges that will require the development of a more comprehensive record than

currently exists. Pro-active Commission direction will be necessary to assure that necessary studies are properly designed to yield data that informs the Commission's decision-making process, that all stakeholders have a role in the process, and that the studies are conducted as promptly as possible. Such Commission leadership will help assure the appropriate balance between protecting incumbent users of the band and establishing a robust market for unlicensed use of the band, particularly as the Commission focuses on the thorny issues associated with designation of the 5350-5470 MHz and 5850-5925 MHz bands for U-NII use.

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COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

The Telecommunications Industry Association ("TIA") hereby submits its comments in response to the Commission's *Notice of Proposed Rulemaking* ("*NPRM*") in this proceeding.[1] As the leading trade association for the information and communications technology ("ICT") industry,[2] TIA applauds the Commission for framing the *NPRM* to not only satisfying Congress' mandate that a proceeding be commenced to consider allowing unlicensed national information infrastructure ("U–NII") devices to operate in the 5350-5470 MHz band,[3] but to holistically confront a wide range of questions regarding the future of unlicensed use of the 5 GHz band.

[1] Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, *Notice of Proposed Rulemaking*, 28 FCC Rcd 1769 (2013) ("*NPRM*")*.*

[2] TIA represents the global ICT industry through standards development, advocacy, business opportunities, market intelligence and networking. TIA's member companies manufacture or supply the products and services used in global communications across all technology platforms. Since 1924, TIA has been enhancing 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, public safety, transportation, government, the military, the environment and entertainment. TIA is accredited by the American National Standards Institute ("ANSI"). TIA represents its members on the full range of public policy issues affecting the ICT industry and forges consensus on industry standards.

[3] *See* Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156, 231, §6406(a) (2012) ("Spectrum Act"), *codified at* 47 U.S.C. § 1453(b).

Identifying and implementing the right answers to those questions, some of which are likely to prove quite challenging, is of critical importance not only for manufacturers of U–NII equipment, but also for the millions of American consumers, enterprises, and service providers that are increasingly dependent upon 5 GHz unlicensed technology to meet their wireless communications needs.

I. INTRODUCTION

This proceeding provides a unique opportunity for the Commission and industry to work together to fine-tune the rules that govern sharing the 5150-5350 MHz and the 5470-5825 MHz bands between U-NII devices and federal incumbents,[4] and to permit U-NII use on a shared basis over much needed additional spectrum in the 5350-5470 MHz and 5850-5925 MHz bands.

Commission leadership will be critical to the successful and prompt completion of the ambitious agenda for the 5 GHz set forth in the *NPRM*. As discussed in more detail below, several of the issues raised by the *NPRM* have been the subject of extensive study by the Commission, other governmental stakeholders and industry over the course of several years. In those cases, the Commission can and should take advantage of that experience to promptly address the proposals set forth in the *NPRM* and issue appropriate changes to the 5 GHz rules and implementing procedures. On the other hand, some of the issues raised by the Commission present novel challenges that will require the development of a more comprehensive record than currently exists. The record should be based on the participation of all stakeholders – government and private sector alike. In some cases, that process is going to require additional

[4] *See* Revision of Parts 2 and 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) devices in the 5 GHz band, *Notice of Proposed Rulemaking*, 18 FCC Rcd 11581 (2003); *Report and Order*, 18 FCC Rcd 24484 (2003); *Order*, 20 FCC Rcd 4883 (2005); *Memorandum Opinion and Order*, 21 FCC Rcd 7672 (2006).

technical study. Pro-active Commission direction will be necessary to assure that the studies are properly designed to yield data that informs the Commission's decision-making process, that all stakeholders have a role in the process, and that the studies are conducted as promptly as possible. Such Commission leadership will help assure the appropriate balance between protecting incumbent users of the band and establishing a robust market for unlicensed use of the band, particularly as the Commission focuses on the thorny issues associated with designation of the 5350-5470 MHz and 5850-5925 MHz bands for U-NII use.

As discussed below, the Commission can and should take appropriate measures necessary to address the problem of interference by outdoor U-NII deployments to Terminal Doppler Weather Radar ("TDWR") systems. TIA also strongly supports the proposed expansion of unlicensed access to the 5350-5470 MHz and 5850-5925 MHz bands, but urges the Commission to act in a technologically neutral manner and afford suitable protections for incumbents. Throughout the 5 GHz band, the Commission should seek to foster coexistence of incumbent systems and unlicensed technologies, while at the same time minimizing the potential for congestion among U-NII users. As a general proposition, TIA supports the harmonization of the Commission's power, emissions and indoor/outdoor use rules across all of the 5 GHz U–NII bands, but recognizes that it will be necessary to adopt specialized provisions for particular sub-bands to provide appropriate protection to incumbents. More specific proposals in support of these objectives follow.

II. DISCUSSION

A. IMPROVING SPECTRUM AVAILABILITY FOR U–NII DEVICES IS ESSENTIAL TO MEETING AMERICA'S GROWING DEMAND FOR UNLICENSED CAPACITY.

The *NPRM* correctly observes that:

> The U-NII bands hold significant promise for helping to accommodate the needs of businesses and consumers for fixed and mobile broadband communications, and thus it is important that we explore fully ways to reduce significantly the potential for interference to authorized users of the 5 GHz band that arise from U-NII operations.[5]

The demand for wireless data is increasing exponentially. Smartphones are running demanding data-hungry applications – it has been suggested that monthly mobile data usage is already approaching 1 gigabit, with many users and devices using much more.[6] In addition to smartphones, data traffic is being driven to record levels in the United States and globally by the emergence of connected tablets and portable personal computers. Indeed, it was recently reported that, as of December 2012, 174 million of the 326 million connections to U.S. mobile networks consisted of smartphones, laptops, tablets or modems.[7] People and business — today's society as a whole — are depending on their mobile devices, everywhere.

The demand is not being, and cannot be, satisfied solely with licensed spectrum. Unlicensed spectrum, including the 5 GHz U-NII band, plays an increasingly important role in meeting the escalating demand for wireless data traffic. Recently published data from Cisco Systems, Inc., for example, estimates that in the United States, commercial wireless networks are already offloading 47% of all traffic to fixed wireline networks and project that offloading will grow to 66% by 2017.[8] Moreover, it has been recognized that while offloading is part of the

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[5] *NPRM*, 28 FCC Rcd at 1774.

[6] *See, e.g.* Chetan Sharma Consulting, *US Wireless Market Update: Q4 2012 and full year 2012* at 7 (Mar. 2013), *available at* http://www.chetansharma.com/US_Wireless_Market_Q4_2012_Update_March_2013_Chetan_Sharma_Consulting.pdf.

[7] *See* CTIA Semi-Annual Wireless Industry Survey (2013), *available at* http://files.ctia.org/pdf/CTIA_Survey_YE_2012_Graphics-FINAL.pdf.

[8] Cisco, VNI Mobile Forecast Highlights, 2012-2017, (Step 1: United States, Step 2: Network Connections, select Offload Traffic),

solution to the problem of congested cellular networks, "Wi-Fi's popularity is creating congestion issues of its own."[9]

By making available the large swath of contiguous spectrum that can be provided for U-NII at 5 GHz, the Commission can facilitate the provisioning of the multi-gigabit throughput that is needed to support advanced applications, as well as optimizing a more efficient channel arrangement. As the Commission has recognized, "[t]he deployment of wide channel bandwidths with higher data rates in the 5 GHz band can help meet the challenge that rapid growth in demand has posed for the wireless industry . . . ."[10] For this reason, TIA strongly supports the expansion of unlicensed access to the 5350-5470 MHz and 5850-5925 MHz bands on a technology-neutral basis that encourages continued innovation, technological development, and investment. Access to the band should not be limited by the technology employed, but should be open to any technologies that meet the Commission's U-NII rules.

Technologies already are being introduced for unlicensed use that reach unprecedented throughput per second based on the wider channel bandwidths that can be achieved at 5 GHz.

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http://www.cisco.com/web/solutions/sp/vni/vni_mobile_forecast_highlight/index.html#~Country (last visited May 16, 2013) *See also* Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, *Sixteenth Report*, 28 FCC Rcd 3700, 3936 (2013) ["*Sixteenth Wireless Report*"]. As the Commission has recognized, the wireless industry is currently developing standards and technologies to facilitate seamless roaming between Wi-Fi hotspots and 3G/4G networks. *See id.* at 3937.

[9] *See NPRM*, 28 FCC Rcd at 1818. The Commission has recognized, for example, that tablet owners are indicating a strong preference to using Wi-Fi rather than the commercial networks for connectivity. *See Sixteenth Wireless Report*, 28 FCC Rcd at 3808, *citing Philip Goldstein, NPD: Tablet Users Increasingly Favor Wi-Fi Over Cellular Connections, FIERCEWIRELESS, Dec. 12, 2011*, http://www.fiercewireless.com/story/npd-tablet-users-increasingly-favor-wi-fiover-cellular-connections/2011-12-12; Philip Goldstein, Localytics: Only 6% of iPad Data Sessions are on Cellular Networks, *FIERCEWIRELESS*, Mar. 23, 2012, http://www.fiercewireless.com/story/localytics-only-6-ipad-data-sessions-are-cellular-networks/2012-03-23.

[10] *NPRM*, 28 FCC Rcd at 1794.

One such technology is the next generation of Wi-Fi, IEEE 802.11ac. As the *NPRM* correctly recognizes, IEEE 802.11ac allows a significant increase in data rates by empowering wider channel bandwidths than prior Wi-Fi standards, and is designed to take maximum advantage of the large contiguous 5 GHz band that would be created in the United States by designation of the 5350-5470 MHz and 5850-5925 MHz bands for U-NII use.[11] IEEE 802.11ac is here today — although the standard will not receive final ratification for approximately eight months,[12] products began entering the market based on the final draft standard late last year. Numerous vendors are making products available today,[13] and the number of different units on the market and shipments in volume will be growing as the year progresses.[14] Or, under the technology-neutral approach TIA advocates, designation of additional U-NII spectrum in the 5 GHz band could provide capacity for data offload by heterogeneous networks, particularly in urban areas, airports, stadiums and similar area where congestion is a growing concern.

Prompt and decisive action to make additional 5 GHz spectrum for U–NII devices in the United States will also solidify America's leadership role on the global stage. The *NPRM* asks

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[11] *See id*. at 1775, 1784.

[12] *See IEEE 802.11 Working Group Project Timelines – 2013-03-22* (Mar. 22, 2013), http://grouper.ieee.org/groups/802/11/Reports/802.11_Timelines.htm (noting that final working group approval and executive committee approval is scheduled for November 2013, with final ratification in February 2014).

[13] *See, e.g.*, Dong Ngo, *Networking and Wi-Fi: Best 802.11ac routers,* C|Net, (Apr. 26, 2013), http://reviews.cnet.com/best-wireless-networking-devices/; Samara Lynn, *The Best 802.11ac Wireless Routers*, PC Magazine (Apr. 9, 2013), *available at* http://www.pcmag.com/article2/0,2817,2417528,00.asp.

[14] *See* Vaughn-Nichols, *2013: The year Gigabit Wi-fi arrives*, ZDNet (Jan. 7, 2013), *available at* http://www.zdnet.com/2013-the-year-gigabit-wi-fi-arrives-7000009480/. *See also NPRM*, 28 FCC Rcd at 1794, *citing* Zero to a Billion; 802.11ac-Enabled Device Shipments to Soar by 2015, In-Stat (Feb. 08, 2011), *available at* http://www.marketwire.com/press-release/zero-to-a-billion-80211ac-enabled-device-shipments-to-soar-by-2015-says-in-stat-1391854.htm.

about the relationship between international spectrum planning at the World Radiocommunication Conference in 2015 ("WRC–15") and this proceeding's consideration of the technical requirements for this spectrum.[15] In its recent report on 5 GHz band sharing,[16] the National Telecommunications and Information Administration ("NTIA") addresses the interrelationship between this domestic proceeding to allow U–NII devices access to additional 5 GHz spectrum and United States preparation for WRC–15, setting out milestones throughout 2013 and 2014 for coordinating the international studies needed in preparation for WRC–15 with the domestic rulemaking process.[17] In particular, NTIA said that it was taking steps to incorporate both incumbent and U–NII system characteristics into its preparatory studies to "best position the United States for work in the ITU–R as other countries will inevitably bring forward studies on these bands."[18] TIA submits that the best way for the Commission to further the United States' position at WRC–15 is to move this proceeding forward expeditiously; developing domestic approaches to sharing that can be shared at WRC-15 in furtherance of America's global leadership with respect to the 5 GHz band.

To achieve its objectives in this proceeding, the Commission should move forward with the following goals in mind:

- Consistent with the Commission's obligations under the Spectrum Act and its general mandate to advance the public interest, the Commission should provide

[15] *Id*. at 1794.

[16] U.S. Department of Commerce, National Telecommunications and Information Administration, *Evaluation of the 5350-5470 MHz and 5850-5925 MHz Bands Pursuant to Section 6406(b) of the Middle Class Tax Relief and Job Creation Act of 2012* (Jan. 2013) ("*NTIA 5 GHz Report*"), *available at* http://www.ntia.doc.gov/files/ntia/publications/ntia_5_ghz_report_01-25-2013.pdf.

[17] *Id.* at 6-3 – 6-4.

[18] *Id.* at 6-3.

appropriate levels of interference protection to federal and other incumbents in the 5 GHz band;

- The Commission should foster continued growth of the U-NII marketplace by providing a clear path forward to the designation of additional spectrum for U-NII-2B and U-NII-4, subject to the protection of incumbents;

- To the extent possible, the Commission should strive to provide U-NII devices access to the broadest possible swath of contiguous spectrum under harmonized rules that will accommodate the evolution towards substantially wider channel bandwidths and the efficiency that results for those wider channels;

- The Commission should adopt technology neutral rules for the 5 GHz U-NII band that encourage co-existence of incumbent systems and unlicensed technologies while minimizing the sort of congestion that is proving problematic at 2.4 GHz.

- Timely action is essential. Rather than await the resolution of all of the questions raised by the *NPRM*, the Commission should address issues on a staggered basis as they become ripe for resolution. NTIA has set aggressive milestones for its own actions, and the Commission should do likewise.

B. THE COMMISSION SHOULD ADDRESS THE ISSUES RAISED IN THE NPRM THROUGH A SERIES OF REPORTS AND ORDERS.

In the words of the D.C. Circuit (paraphrasing Voltaire), "[t]he best must not become the enemy of the good, as it does when the FCC delays making any determination while pursuing the perfect [outcome]."[19] As the Commission tackles the numerous issues raised by the *NPRM*, TIA encourages the Commission to adopt a series of reports and orders in this proceeding, moving to resolve issues as quickly as it is possible to do so, without delaying until all of the questions presented by the *NPRM* can be answered. As the *NPRM* recognizes, data-driven decision-making on some of the issues raised in the *NPRM* may require additional record development (for example, in the form of sharing studies) that may be somewhat time-consuming.[20] Waiting

[19] *MCI Telecommunications Corp. v. FCC*, 627 F.2d 322, 341-42 (D.C. Cir. 1980).

[20] *See, e.g., NPRM*, 28 FCC Rcd at 1794 (discussing the ITU's initiation of sharing studies that remain ongoing); *id*. at 1800 (discussion NTIA's initial sharing studies and conclusion that additional analysis is needed); *NTIA 5 GHz Report* at 6-4 (describing plans for submitting future

until all of the issues raised in the *NPRM* can be decided would forego substantial benefits that will be realized if the Commission takes early actions on those issues that are readily resolvable.

Consistent with such a modular approach, the Commission should provide industry with reasonable and reliable expectations for the time frames for final decisions in this modular process, as NTIA has already done.[21] It is important for the Commission to work toward reasonable dates for resolution of the issues so that the stakeholders can assign the resources needed to conduct any necessary studies and resolve the issues. TIA strongly urges the Commission to begin issuing the first in a series of reports and orders in the fourth calendar quarter of 2013.

To facilitate this approach, TIA suggests the following five modules for decision-making, some of which can be resolved together, while others can be resolved alone:

1. TDWR/DFS Compliance Procedure Issues

The *NPRM* recounts at length the concerns that were first raised in early 2009 by the Federal Aviation Administration ("FAA") regarding interference from by wireless internet service providers to TDWR systems operating at 5600-5650 MHz and the efforts that the Commission, other governmental stakeholders, and industry have undertaken over the past four years to resolve the potential for interference from outdoor U-NII devices to TDWR.[22] The *NPRM* proposes several rule and policy changes designed to assure that the mandatory dynamic

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recommendations to the Commission after multiple additional studies, including revised analysis and modeling assumptions, revised sharing studies, and laboratory and field measurements).

[21] NTIA divides 2013-2014 into six blocks ranging from two to eight months, setting specific milestones for its completion of the quantitative evaluation process and submission of recommendations to the Commission and an international task group. *NTIA 5 GHz Report* at 6-4 (Table 6-2 – Tentative Schedule and Milestones for Completing Quantitative Evaluation).

[22] *See NPRM*, 28 FCC Rcd at 1782-84. *See also NTIA 5 GHz Report* at 3-4 – 3-6.

frequency selection ("DFS") function for U-NII-2A and U-NII-2C devices adequately detects and avoids interference to TDWR systems and cannot be circumvented.[23]

The proposed modification to the Bin 1 Waveforms and related procedures utilized by the Commission for DFS certification testing to more accurately emulate the transmitted TDWR waveform was the result of a consensus among government and industry developed after years of study and, at this stage, should not be the subject of extended debate.[24] As is recognized in the *NPRM*, the Office of Engineering and Technology ("OET") has delegated authority to implement modifications to the DFS measurement procedures without the formality of a notice and comment rulemaking proceeding.[25] Given that the changes to the measurement procedures proposed in the *NPRM* are the result of a consensus among the relevant stakeholders, OET should be encouraged to implement them as quickly as possible following the closing of the pleading cycle.

2. Non-Controversial U-NII Rule Changes

[23] *See NPRM*, 28 FCC Rcd at 1785. Among the proposals advanced by the Commission are to require that manufacturers implement security features in any digitally modulated device capable of operating in the U-NII bands, so that third parties are not able to reprogram the devices to operate outside the parameters for which the device was certified and, for devices operating in the U-NII-2A and U-NII-2C bands, lowering the permitted power spectral density for lower power devices that use the relaxed sensing threshold, and modifying the Bin 1 radar simulating waveform used in certification procedures. *See id.* at 1790-92. TIA submits that adoption of these proposals is sufficient to mitigate the threat of interference to TDWR, and agrees with the Commission that the addition of a geo-location/database approach would add undue cost and complexity to U-NII devices. *See id.* at 1787.

[24] *See* Letter from Lawrence E. Strickling, Assistant Secretary for Communications and Information, National Telecommunications and Information Administration, to Julius Genachowski, Chairman, Federal Communications Commission, EB Docket No. 13-49, at 2-3 (dated Feb. 19, 2013).

[25] *See NPRM*, 28 FCC Rcd at 1792.

TIA anticipates that upon close of the pleading cycle, it also will be apparent that there is no controversy regarding many of the 5 GHz U-NII rule changes proposed in the *NPRM*. For example, it is unlikely that there will be much debate over the merits of extending the 5725-5825 MHz U-NII-3 band by 25 megahertz to 5725-5850 MHz.[26] Moreover, given how well understood the issue of interference to TDWR is at this juncture, TIA anticipates that several proposals designed to protect TDWR through formal rules changes (as opposed to changes in the OET-directed DFS compliance procedures discussed above), such as requiring enhanced security of software to guard against improper user modifications and requiring any point-to-point U-NII-3 device reduce peak transmitter power and peak power spectral density by 1 dB for every 1 dB that the antenna gain exceeds 23 dBi,[27] will not prove particularly controversial. Similarly, the various minor changes to Sections 15.403, 15.407, 15.215 and 15.247 of the Rules proposed in Paragraph 113 of the *NPRM* should be non-controversial.[28] These issues can and should be addressed quickly, and certainly can be resolved by the end of the calendar year.

3. Other Proposed Changes to Existing 5 GHz U-NII Rules

There are likely to be additional rule changes that, while perhaps not unanimously endorsed by participants in the proceeding, nonetheless can be resolved without additional

[26] *See id*. at 1778-79. As noted in the *NPRM*, modifying the U-NII-3 band as proposed would "eliminate the complexity and costs associated with multiple rule part certifications" for devices that employ the entire 5725-5850 MHz band and today must certify under Section 15.247 of the Rules to gain access to the upper 25 megahertz. *See id* at 1778. Ideally TIA would hope that the Commission can address its proposal to modify Section 15.407 of the Rules to afford greater technical flexibility and require that all devices in the 5725-5850 MHz band be certified under that revised section quickly. However, there are benefits to manufacturers in being able to certify devices operating across the entire 5725-5850 MHz band even under the existing Section 15.407, so expansion of the U-NII-3 designation should not necessarily await resolution of the technical issues.

[27] *See id*. at 1780.

[28] *See id*. at 1802.

studies or testing. Examples may include the Commission's proposal to harmonize the U–NII-1 RF emission and indoor/outdoor rules with those for U–NII-2A,[29] and its proposal to subject the 5725-5850 MHz band to the technical requirements of a somewhat modified Section 15.407 of the Rules in place of Section 15.247. Although it may not be possible to address those proposals by the fourth quarter of 2013, they present questions that are far less complex than those involving the proposed sharing of 5350–5470 MHz and 5850–5925 MHz among incumbents and U-NII, and thus should be capable of resolution before the proposed designation of those bands for U-NII is ripe for decision.

5. Designation of 5350–5470 MHz and 5850-5925 MHz for U-NII

Designating on a shared basis of the 5350-5470 MHz band as the U-NII-2B band and the 5850-5925 MHz band as the U-NII-4 band poses unique challenges given the wide range of incumbent services already in the bands.[30] Although each of these bands presents a unique set of challenges, what they share is that the issues around permitting U-NII use of neither band will be ripe for decision until well after the other issues raised in the *NPRM*. Thus, it is imperative that the Commission not await resolution of the issues surrounding these bands before moving

[29] *See id*. at 1781-82. Specifically, the *NPRM* has sought comment on whether it should increase the power limits for U-NII-1 to those applicable in the U-NII-2A band (*i.e*., 250 mW with a maximum EIRP of 30 dBm with 6 dBi antenna gain), whether the rules for the U-NII-1 band should be modified to increase the PSD limits to those applicable in the U-NII-2A band, (*i.e*., 11 dBm/MHz), and on whether the rules for the U-NII-1 band should be modified to eliminate the restriction on outdoor operation, and, if so, whether to allow outdoor operation only under the current power and PSD limits for the band or under the limits now permitted only in the U-NII-2 bands. TIA agrees with the Commission's assessment that "[h]armonizing the power and use conditions across the lower 200 megahertz of U-NII spectrum would likely permit the introduction of a wide-range of new broadband products capable of operating at higher data rates than is now possible." *See id* at 1782. Moreover, TIA agrees with the Commission that because radar is not present in the U-NII-1 band, there is no need to include a DFS requirement on U-NII-1 equipment as part of the harmonization of the U-NII-1 and U-NII-2A rules. *See id.* at 1781.

[30] *See id*. at 1794-97.

forward with issues that are ripe for more rapid resolution. Moreover, given the unique issues presented by sharing each of these bands, the Commission should be open to issuing a separate report and order dealing with each, likely with the resolution of the 5850-5925 MHz band taking precedence because the issues appear more readily resolvable.

Section 6406(a) of the Spectrum Act makes clear that sharing of 5350–5470 MHz can only be authorized if the Commission, in consultation with NTIA, concludes that there are technical solutions available that assure that protection to licensed users and that federal spectrum users in the band are not compromised by the introduction of U-NII devices.[31] NTIA, as required by Section 6406, has conducted an evaluation of the risks to federal users of allowing unlicensed users into both the 5350-5470 MHz and the 5850-5925 MHz bands. NTIA has concluded that risk elements do exist[32] and that "further analysis [will be] required to determine whether and how the identified risk factors can be mitigated through, for example, by the promulgation of new safeguards in addition to the FCC's existing requirements."[33]

Those processes will not be easy – NTIA has noted that the analysis will be more complex than that which led to existing 5 GHz sharing because the number of sharing scenarios are greater and "the practical limitations of using existing or modified spectrum-sharing technologies to protect different types of operations and platforms . . . need to be assessed and evaluated."[34] NTIA has suggested a tentative schedule and milestone for completing that

[31] Spectrum Act § 6406(a), 126 Stat. at 231, *codified at* 47 U.S.C. § 1453(b).

[32] *See NTIA 5 GHz Report* at 4-1 – 4-15 and 5-1 – 5-12.

[33] *Id.* at 6-2.

[34] *Id.*

analysis that does not call for the submissions of recommendations until the second half of 2014.[35]

TIA and its member companies hope to have an opportunity to work with NTIA to expedite the process so that the Commission will be in a position to allow U-NII use of these bands as rapidly as possible (bifurcating them into separate reports and orders should the evaluation of one lag behind the other). Indeed, the Commission should take steps early on to promote and, in appropriate circumstances, lead meetings, panels, workshops, and other discussions among the various stakeholders to expedite the process. By taking a pro-active approach early in the evaluative process, the Commission will be able to expedite the development of a record to inform its own data-drive decision-making process. And that, in turn, will allow the Commission to more quickly identify mechanisms by which these bands can be shared productively between incumbents and U-NII and expedite the benefits to the public that will come from creating at 5 GHz a large, contiguous band supporting unlicensed use.

The Spectrum Act clearly dictates that the Commission can only permit U-NII sharing in the 5350–5470 MHz band, if, in consultation with NTIA, the Commission concludes that "licensed users will be protected by technical solutions . . ." and "the primary missions of Federal spectrum users . . . will not be compromised."[36] Although no similar standard is set forth with regard to sharing between U-NII and other users of the 5850–5925 MHz band, the Commission's more general public interest standard governing rulemaking proceedings will be its lodestone in evaluating opening of the 5850-5925 MHz band for U-NII use.

[35] *See id.* at 6-4.

[36] Spectrum Act at § 6406(a)(2)(A)-(B), *codified at* 47 U.S.C. § 1453(a)(2)(A)-(B).

TIA is particularly concerned that whatever rules the Commission adopts to govern U-NII-4 operations, those rules provide appropriate levels of protection to Dedicated Short Range Communications ("DSRC") systems in the Intelligent Transportation System ("ITS") radio service. As recognized in the *NPRM*, DSRC is a two-way short- to medium-range wireless communications system that facilitates vehicular safety applications through vehicle-to-vehicle and vehicle-to-infrastructure communications critical for communications-based active safety applications.[37] This service is in the late stages of development and may soon be mandated as a safety feature for automobiles and light trucks by the Department of Transportation ("DOT").[38]

As envisioned by the transportation sector, DSRC will operate as a "commons" for the surface transportation sector to support vehicle-to-vehicle radio communications, and eventually between vehicles and highway infrastructure. The Commission grants licenses for state and regional transportation agencies to operate DSRC roadside units, while DSRC onboard units are licensed by rule under Part 95.[39] Because DSRC applications need to operate with short time delays in complex multipath environments in even the most extreme weather conditions,[40] providing appropriate protection against U-NII interference is critical.

With DSRC moving towards fruition after years of development, the Commission should ensure that the public safety mission of DSRC is not compromise by protecting DSRC from

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[37] *NPRM*, 28 FCC Rcd at 1797.

[38] U.S. Department of Transportation, Research and Innovative Technology Administration ("RITA"), *Dedicated Short Range Communications* (Nov. 15, 2012), http://www.its.dot.gov/DSRC/; RITA, *ITS Research Fact Sheets/DSRC: The Future of Safer Driving* (Nov. 15, 2012), *available at* http://www.its.dot.gov/factsheets/dsrc_factsheet.htm ("RITA Fact Sheet").

[39] The DSRC Road Side Units are authorized under Part 90 (Subpart M) of the Commission's Rules. The On-Board Units are authorized under Part 95 (Subpart L) of the Rules.

[40] RITA Fact Sheet.

harmful interference caused by the introduction of U-NII devices into the band. DOT has noted that the allocation of discrete spectrum for DSRC was important because it assured protection against interference that would have occurred had DSRC been relegated to the traditional Wi-Fi bands,[41] and the Commission can and should take care in this proceeding not to undermine that important benefit.

Although protecting DSRC will be challenging, TIA is optimistic that approaches to successful sharing between DSRC and U-NII devices can be developed. For example, the IEEE 802.11p standard that has been developed as the groundwork for DSRC has similarities to the general Wi-Fi standard.[42] This shared heritage may prove helpful in identifying, understanding and potentially developing sharing solutions. Moreover, there is a potential benefit in cost savings and innovation to DSRC technology, for example, by creating the opportunity for a single chipset/module.[43] The FCC examination of these issues will, of course, need to consider how sharing requirements could be implemented on a technology neutral basis. While substantial additional work will be necessary to develop an approach to U-NII/DSRC sharing, for the reasons set forth above the Commission should exercise a pro-active leadership role to move that process forward as rapidly as possible. Such an expedited approach will provide certainty to manufacturers in both the U-NII and DSRC spaces, enhancing the prospects for bringing both DSRC and enhanced U-NII services to the American public as quickly as possible.

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[41] RITA, *Connected Vehicles Dedicated Short Range Communications Frequently Asked Questions* (Nov. 15, 2012), http://www.its.dot.gov/DSRC/dsrc_faq.htm.

[42] *See id.*

[43] Efforts are already underway within IEEE 802.11 to identify and address U-NII-4 coexistence issues between 802.11p and 802.11ac. *See, e.g.* Lansford and Kenney, *Coexistence issues between 802.11p and 802.11ac in the proposed UNII-4 band,* doc:IEEE 802.11-13/0552r0 (May 2013).

III. CONCLUSION

This is a highly technical proceeding, presenting new sharing challenges that must be addressed in a timely manner. To accomplish this, all stakeholders from both the private and public sectors must be involved at the every possible stage. TIA looks forward to working with the Commission throughout this proceeding to assure an outcome that best serves not only its member companies, but the wide range of consumers, enterprise customers, service providers and others that can benefit from enhanced access to the 5 GHz U-NII band.

Respectfully submitted,

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May 28, 2013