

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
	)	
	)	
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
	)	
	)	
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM-11664
	)	
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112
	)	
	)	
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95
	)	

**COMMENTS OF CTIA**

Thomas C. Power  
Senior Vice President, General Counsel

Scott K. Bergmann  
Vice President, Regulatory Affairs

Paul Anuskiewicz  
Vice President, Spectrum Planning

Brian M. Josef  
Assistant Vice President, Regulatory Affairs

Kara D. Romagnino  
Director, Regulatory Affairs

**CTIA**  
1400 Sixteenth Street, NW  
Suite 600  
Washington, DC 20036  
(202) 785-0081

September 30, 2016

## TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY .....	1
II.	CTIA APPLAUDS THE COMMISSION’S EFFORTS TO UNLEASH ADDITIONAL SPECTRUM FOR MOBILE BROADBAND SERVICES. ....	4
III.	THE MILLIMETER WAVE BANDS SHOULD BE MADE AVAILABLE ON A LICENSED, EXCLUSIVE-USE BASIS.....	8
IV.	THE COMMISSION SHOULD ENSURE THAT THE 40-42 GHZ, 50 GHZ, AND 70/80 GHZ BANDS ARE ALLOCATED WITH THE FEWEST POSSIBLE ENCUMBRANCES.....	12
V.	THE COMMISSION SHOULD ADOPT A FLEXIBLE APPROACH TO PERFORMANCE REQUIREMENTS. ....	16
VI.	A “USE IT OR SHARE IT” REQUIREMENT WOULD HARM 5G INVESTMENT, STIFLE INNOVATION, AND DELAY DEPLOYMENT.....	19
VII.	THE COMMISSION SHOULD NOT IMPLEMENT A SAS-TYPE SHARING MECHANISM IN THE 37-37.6 GHZ BAND. ....	22
VIII.	CONCLUSION.....	24

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
	)	
	)	
Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
	)	
	)	
Petition for Rulemaking of the Fixed Wireless Communications Coalition to Create Service Rules for the 42-43.5 GHz Band	)	RM-11664
	)	
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services	)	WT Docket No. 10-112
	)	
	)	
Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands; Allocation of Spectrum to Upgrade Fixed and Mobile Allocations in the 40.5-42.5 GHz Frequency Band; Allocation of Spectrum in the 46.9-47.0 GHz Frequency Band for Wireless Services; and Allocation of Spectrum in the 37.0-38.0 GHz and 40.0-40.5 GHz for Government Operations	)	IB Docket No. 97-95
	)	

**COMMENTS OF CTIA**

**I. INTRODUCTION AND SUMMARY.**

CTIA<sup>1</sup> respectfully submits these comments in response to the Commission’s Further Notice of Proposed Rulemaking (“*FNPRM*”) seeking comment on proposed rules that would

---

<sup>1</sup> CTIA<sup>®</sup> ([www.ctia.org](http://www.ctia.org)) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21<sup>st</sup> century connected life. The association’s members include wireless carriers, device manufacturers, suppliers as well as apps and content companies. CTIA vigorously advocates at all levels of government for policies that foster continued wireless innovation and investment. The association also coordinates the industry’s voluntary best practices, hosts educational events that

authorize mobile operations in additional spectrum bands above 24 GHz.<sup>2</sup> CTIA applauds the Commission for the important work it has already done to establish mobile service rules for the 28 GHz, 37 GHz, 39 GHz, and 64-71 GHz bands. The *FNPRM* builds upon the Commission's Spectrum Frontiers efforts by proposing regulatory policies for the 24 GHz, 32 GHz, 42 GHz, 47 GHz, 50 GHz, and 70/80 GHz bands.

CTIA and its members share the Commission's goal of advancing the next generation of wireless services and unleashing the 5G revolution. Throughout this proceeding, industry has outlined an aggressive vision of 5G technologies and services. From smart cities to connected cars to virtual reality, 5G will transform the mobile experience as we know it today, ushering in an array of paradigm-shifting applications and features. As Chairman Wheeler expressed, "5G is like the missing piece of the puzzle depicting the wireless future: Where today's wired and wireless networks force customers to choose EITHER high speed and capacity OR mobility, 5G's promise of gigabit mobile connections at any location will open up hugely disruptive new value propositions for the users of networks."<sup>3</sup> 5G development is already underway in laboratories across the United States as the wireless industry strives to achieve the "ultra-high-speed, high-capacity, low-latency, secure mobile connectivity" consumers will expect on the next frontier of wireless services.<sup>4</sup>

---

promote the wireless industry and co-produces the industry's leading wireless tradeshow. CTIA was founded in 1984 and is based in Washington, D.C.

<sup>2</sup> *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 (2016) ("*Order & FNPRM*").

<sup>3</sup> Remarks of FCC Chairman Tom Wheeler, CTIA Super Mobility Show 2016, at 2 (Sept. 7, 2016), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2016/db0907/DOC-341138A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0907/DOC-341138A1.pdf) (emphasis original).

<sup>4</sup> *Id.*

The Commission has shown tremendous leadership in recognizing the potential the millimeter wave bands hold for facilitating the transition to 5G services. But there is more work left to be done. Specifically, the Commission can best promote a robust millimeter wave ecosystem by taking the following actions:

- In the spirit of securing the United States’ leadership role as a wireless leader, the Commission should move forward with setting an auction date for the millimeter wave bands that the *Order* reallocated for mobile uses. As the rest of the world begins exploring 5G possibilities, the United States should take concrete steps toward bringing this spectrum to market to ensure the deployment of next-generation mobile broadband systems.
- As the Commission moves forward with exploring additional bands above 24 GHz for 5G services, it should not lose sight of the paramount importance of mid- and low-band spectrum. It should continue to identify all opportunities for freeing spectrum below 24 GHz for mobile services. While the millimeter wave bands will help strengthen 5G network capacity, mid- and low-band spectrum will continue to drive network coverage.
- To encourage the innovation and investment necessary to elevate 5G systems to their full potential, the Commission should make the bands discussed in the *FNPRM* available on a licensed, exclusive-use basis. The Commission already repurposed a full seven gigahertz of spectrum for unlicensed uses in the 64-71 GHz band—compared to the 3.25 gigahertz of millimeter wave spectrum allocated for licensed, exclusive use—and earmarked another 600 megahertz for experimental sharing in the 37-37.6 GHz band. With substantial millimeter wave spectrum already available for unlicensed and shared use, deploying exclusive-use licensing policies in the bands being considered in the *FNPRM* is all the more important.
- The Commission should seize this opportunity to ensure that the 40-42 GHz, 50 GHz, and 70/80 GHz bands are allocated with the fewest encumbrances possible. Specifically, the Commission should not overlook the opportunity to create a contiguous 5.5 gigahertz block of spectrum (from 37 to 42.5 GHz) for exclusive, licensed use and actively explore the suitability of the 40-42 GHz band for mobile broadband. It should also resist efforts to derail or delay deployments in the 50 GHz band by opening additional, redundant proceedings. And, it should retain a modified version of the existing licensing framework in the 70/80 GHz bands rather than experimenting with a spectrum access system (“SAS”)-type regime in those bands.
- Licensees of millimeter wave spectrum should be subject to performance requirements that reflect the technological realities of 5G deployments and systems. Flexibility should be the hallmark of the Commission’s approach to

performance metrics. The Commission should offer non-exhaustive, representative safe harbor examples of the kinds of deployments that will satisfy the case-by-case performance milestone analysis.

- To avoid stifling innovation and undermining investment before 5G deployment begins in earnest, the Commission should decline to impose “use it or share it” requirements in the millimeter wave bands.
- The Commission should refrain from implementing an untested SAS model in the 37-37.6 GHz band. SAS models have still not been successfully deployed in any real-world environment. The millimeter wave spectrum is simply too important to be used as a test bed for such a complex scheme.

Millimeter wave spectrum will no doubt play a critical role in the 5G revolution, enabling myriad new technological advancements – from the Internet of Things (“IoT”) to telemedicine products and beyond. By adopting these proposals, the Commission will help ensure a robust 5G ecosystem, cementing the United States’ place as the unquestioned leader in mobile technologies and services for generations to come.

## **II. CTIA APPLAUDS THE COMMISSION’S EFFORTS TO UNLEASH ADDITIONAL SPECTRUM FOR MOBILE BROADBAND SERVICES.**

Consumers’ increasing smartphone adoption coupled with exceptional 4G LTE services have fueled a meteoric rise in mobile broadband usage. As the Commission’s most recent wireless competition report demonstrates, wireless broadband is offered ubiquitously and in a highly competitive environment. As of the end of 2015, 99.7 percent of the U.S. population had access to 4G LTE wireless service, with 89.1 percent having access to four or more providers.<sup>5</sup> With more Americans having access to 4G LTE services, total U.S. wireless data traffic

---

<sup>5</sup> *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions with Respect to Mobile Wireless, Including Commercial Mobile Services*, Nineteenth Report, DA 16-1061, WT Docket No. 16-137, ¶ 39 (rel. Sept. 23, 2016) (“19<sup>th</sup> Mobile Wireless Competition Report”).

increased approximately 138 percent from 2014.<sup>6</sup> Indeed, data usage in the U.S. far surpasses usage internationally. In 2015, American mobile users generated an average of 2,245 MB of mobile data traffic per connection per month, compared to only 921 MB for Central and Eastern Europe and 405 MB for the Asia-Pacific region.<sup>7</sup> This robust growth in data traffic shows no signs of slowing.<sup>8</sup> Projections estimate that by 2020, the average North American wireless subscriber will consume about 22 gigabytes of mobile data per month, compared to approximately 18 gigabytes for the average subscriber in Western Europe.<sup>9</sup> At this rate, estimates predict that mobile data traffic will grow twice as fast as fixed IP traffic from 2015 to 2020.<sup>10</sup>

The transition to 5G networks and services will only accelerate this growth<sup>11</sup> as innovators turn their attention to the IoT, which promises billions of new connections in the near future. By 2021, Ericsson estimates that there will be approximately 28 billion connected

---

<sup>6</sup> See *id.* ¶ 126 (citing CTIA Annual Survey); see also Comments of CTIA, GN Docket No. 16-137, at 12-13 (May 31, 2016) (“CTIA Competition Report Comments”).

<sup>7</sup> See Comments of CTIA, GN Docket No. 16-245, at 20-21 (filed Sept. 6, 2016) (“CTIA Section 706 NOI Comments”).

<sup>8</sup> See Ericsson, *Ericsson Mobility Report: On the Pulse of the Networked Society*, at 6 (June 2016) (predicting that 5G subscription uptake will be faster than it was for 4G); Reply Comments of Sprint Corp., GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 2-3 (Feb. 26, 2016) (“The demand from wireless consumers for high-speed data is well-documented and that demand will only increase as 5G systems are tested, deployed, and operationalized.”).

<sup>9</sup> CTIA Section 706 NOI Comments at 12; CTIA Competition Report Comments at 14.

<sup>10</sup> Cisco, *Visual Networking Index Mobile Forecast*, available at [http://www.cisco.com/assets/sol/sp/vni/forecast\\_highlights\\_mobile/index.html#~Country](http://www.cisco.com/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country).

<sup>11</sup> By the end of 2015, there were already 291 million active Internet-capable devices in the United States, up from 270 million at the end of 2014. CTIA Competition Report Comments at 12; see also *19<sup>th</sup> Mobile Wireless Competition Report* ¶13 (noting that 5G “networks and services are expected to usher in an era of explosive growth” for machine-to-machine (“M2M”) communications).

devices in circulation, nearly 16 billion of which will be related to IoT.<sup>12</sup> User-linked 5G connections alone will reach 690 million in 2025.<sup>13</sup> Through new devices and services, 5G networks will enable connected homes, cities, cars, and lives, revolutionizing the mobile experience as we know it today. To make this ambitious 5G vision a reality, however, the wireless industry will need more licensed spectrum—and extensive amounts of it.<sup>14</sup>

With wireless services growing more advanced and spectrum becoming increasingly scarce, exploring the use of the millimeter wave bands for mobile services is essential. Ensuring that spectrum allocation and deployment keep pace with growing consumer demands will be critical in maintaining the United States' position as the world's foremost wireless leader. No doubt, as Commissioner Rosenworcel aptly noted, “[t]he race to 5G is on” and it is a “race that we want to win.”<sup>15</sup> To this end, CTIA applauds the Commission for its leadership in quickly developing rules to allocate several millimeter wave bands for mobile services.<sup>16</sup> By unlocking

---

<sup>12</sup> 19<sup>th</sup> *Mobile Wireless Competition Report* at n.34 (citing Ericsson, *Ericsson Mobility Report: On the Pulse of the Networked Society*, at 10 (June 2016), <https://www.ericsson.com/res/docs/2016/ericsson-mobility-report-2016.pdf>).

<sup>13</sup> Strategy Analytics, *Strategy Analytics: 5G to reach 690M Connections and 300M Handset Shipments by 2025* (Aug. 23, 2016), <https://www.strategyanalytics.com/strategy-analytics/news/strategy-analytics-press-releases/strategy-analytics-press-release/2016/08/23/strategy-analytics-5g-to-reach-690m-connections-and-300m-handset-shipments-by-2025#.V-PPjvkrKUK>.

<sup>14</sup> Coleman Bazelon & Giulia McHenry, *Substantial Licensed Spectrum Deficit (2015-2019): Updating the FCC's Mobile Demand Projections*, THE BRATTLE GROUP, at 6-7 (Jun. 23, 2015) (finding the wireless industry will need more than 350 megahertz of new licensed spectrum by 2019 to meet growing data demand).

<sup>15</sup> Jessica Rosenworcel, Commissioner, *Remarks at Leadership Forum on 5G: The Next Generation of Wireless: Five Ideas for the Road to 5G*, (Feb. 9, 2016), [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-337655A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-337655A1.pdf).

<sup>16</sup> See *Order & FNPRM* ¶ 4.

the 28 GHz, 37 GHz, 39 GHz, and 64-71 GHz bands for mobile uses, the Commission has taken an important step toward facilitating the transition to 5G systems.

But more work must be done to make these bands available for innovative deployments. CTIA therefore urges this Commission, during this administration, to set a date for auctioning the millimeter wave bands identified in the *Order*. The Commission should build upon its momentum in establishing a regulatory framework for the millimeter wave bands by moving forward to auction the newly freed spectrum as soon as possible.

At the same time, the Commission should continue to explore opportunities to reallocate mid- and low-band spectrum for mobile broadband services. Although the millimeter wave bands may be well suited to support 5G services, this high-frequency spectrum will not provide a stand-alone solution to the spectrum crunch.<sup>17</sup> Networks will require access to frequency bands both above *and* below 24 GHz to provide consumers with the seamless 5G experience they will expect. Bands above 24 GHz will serve as an important complement to lower-frequency channels by delivering ultra-high data rates, providing backhaul support, and expanding capacity.<sup>18</sup> Meanwhile, low-band spectrum, particularly the bands below 3 GHz, will be critical for macro network coverage and capacity. Additionally, mid-band spectrum between 3 GHz and 24 GHz will provide coverage and capacity benefits, especially in dense urban/suburban markets. Simply put, ensuring a robust spectrum pipeline across a wide and diverse range of frequencies

---

<sup>17</sup> See Comments of Qualcomm, Inc., GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at i (Jan. 28, 2016) (“Qualcomm NPRM Comments”); Comments of AT&T, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 2-3 (Jan. 28, 2016) (“AT&T NPRM Comments”).

<sup>18</sup> See Reply Comments of AT&T, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 5 (Feb. 26, 2016) (“AT&T NPRM Reply Comments”) (explaining that while the millimeter wave bands may help enhance capacity, low-band spectrum will be vital to 5G network coverage).

will be critical to meeting consumers' increasing data demands and facilitating the transition to 5G. As the Commission considers how to help propel industry forward in the 5G revolution, examining mid- and low-band spectrum for mobile services should remain a top priority.

Similarly, the Commission must continue to work toward streamlining its infrastructure policies so that the dense networks of Distributed Antenna Systems and small cell facilities necessary to support 5G connectivity can be rapidly and efficiently deployed. Today, the wireless industry faces a web of federal, state, local, environmental, cultural, and historic review processes that must be undertaken when deploying wireless infrastructure. These costs and delays will be compounded as providers seek to deploy the tens of thousands of small sites needed for 5G. As Commissioner Pai noted, “[w]ithout a paradigm shift in our nation’s approach to wireless siting and broadband deployment, our creaky regulatory approach is going to be the bottleneck that holds American consumers and businesses back.”<sup>19</sup> CTIA appreciates the efforts already made by the Commission to streamline wireless infrastructure deployment and looks forward to working with the Commission and other stakeholders to make further progress on this goal.

### **III. THE MILLIMETER WAVE BANDS SHOULD BE MADE AVAILABLE ON A LICENSED, EXCLUSIVE-USE BASIS.**

CTIA agrees with Chairman Wheeler’s view that the Commission can best promote 5G deployment and innovation by “repeating the proven formula that made the United States the world leader in 4G.”<sup>20</sup> Flexible, exclusive-use licensing policies have long been the cornerstone

---

<sup>19</sup> Remarks of FCC Commissioner Ajit Pai at the Brandery, *A Digital Empowerment Agenda*, Cincinnati, OH, at 7 (Sept. 13, 2016), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2016/db0913/DOC-341210A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0913/DOC-341210A1.pdf).

<sup>20</sup> Prepared Remarks of FCC Chairman Tom Wheeler, *The Future of Wireless: A Vision of U.S. Leadership in a 5G World* (Jun. 20, 2016), [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-339920A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-339920A1.pdf).

of the Commission’s “proven formula” for wireless leadership. Through the exclusive-use licensing framework, the wireless industry has migrated from 2G to 3G services and secured the United States’ global leadership position in 4G LTE deployment and adoption. Moreover, exclusive-use licensing has attracted substantial spectrum investment, generating more than \$400 billion in economic activity each year.<sup>21</sup> With this proven track record, exclusive-use licensing has become the “gold standard” for meeting consumer demand and optimizing spectrum use.<sup>22</sup>

Commenters agree that an exclusive-use licensing regime will best promote a thriving 5G ecosystem.<sup>23</sup> Although the millimeter wave bands hold great promise for supporting 5G systems, significant research and development must still be done before the spectrum can be put to mobile use.<sup>24</sup> That is why providing a stable and predictable regulatory environment for prospective users is so critical. The certainty inherent in exclusive-use spectrum rights will allow prospective 5G players to confidently invest in developing novel network infrastructure, end-user devices, and other millimeter wave technologies. Promoting investment in the new

---

<sup>21</sup> *Mobile Broadband Spectrum: A Vital Resource for the U.S. Economy*, THE BRATTLE GROUP, at 23 (May 11, 2015).

<sup>22</sup> Reply Comments of Nokia (d/b/a Nokia Solutions and Networks US LLC), GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 7 (Feb. 17, 2015).

<sup>23</sup> *See, e.g., id.*; Comments of Verizon, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 5-6 (Jan. 28, 2016) (“Verizon NPRM Comments”) (emphasizing that the Commission should use “proven policies,” like assigning flexible use licenses to bolster 5G deployments); Reply Comments of Samsung Electronics America, Inc. and Samsung Research America, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 4 (Feb. 26, 2016); Comments of Intel Corporation, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 2 (filed Jan. 26, 2016) (“Intel NPRM Comments”) (explaining that exclusive use licensing is “necessary to eliminate unnecessary risk and uncertainty in the technical and economic aspects of market development”).

<sup>24</sup> *See, e.g.,* Verizon NPRM Comments at 10; AT&T NPRM Comments at 21 (explaining that additional research is required to leverage millimeter wave bands to support 5G systems).

millimeter wave spectrum, in turn, will spark innovation in the bands, pushing the boundaries of 5G services to reach their full potential.

Making the *FNPRM* spectrum bands available on a licensed, exclusive use basis is particularly critical where, as here, the Commission has already allocated ample millimeter wave spectrum for sharing and unlicensed experimentation. Through the *Order*, the Commission repurposed a full seven gigahertz of millimeter wave spectrum in the 64-71 GHz bands for unlicensed uses.<sup>25</sup> Further, the Commission has earmarked an additional 600 megahertz of millimeter wave spectrum for experimental sharing in the 37-37.6 GHz band.<sup>26</sup> By contrast, the Commission allocated just 3.25 gigahertz of millimeter wave spectrum on a licensed, exclusive-use basis. With substantial millimeter wave spectrum already available for unlicensed and shared purposes, deploying exclusive-use licensing policies in the bands discussed in the *FNPRM* is all the more important.

To this end, CTIA supports the Commission's proposals to authorize fixed and mobile services in the 24 GHz, 32 GHz, 42 GHz, 47 GHz, and 50 GHz bands.<sup>27</sup> These bands should be made available on a licensed, exclusive-use basis. More broadly, the licensing frameworks in these five bands should be consistent with the regulatory approach that the Commission adopted for the 28 GHz and 37.6-40 GHz bands.<sup>28</sup> Maintaining regulatory parity across the various millimeter wave bands will streamline compliance efforts and maximize spectrum efficiency.

---

<sup>25</sup> *Order & FNPRM* ¶ 130. This new unlicensed spectrum allotment joins the seven gigahertz of spectrum that had previously been made available for unlicensed uses in the 57-64 GHz bands.

<sup>26</sup> *See id.* ¶ 111.

<sup>27</sup> *See id.* ¶¶ 383, 389, 403, 410, 420.

<sup>28</sup> *See id.* ¶¶ 28-36, 77-82, 122-124. Although the *FNPRM* does not seek comment on cybersecurity requirements adopted in the *Order*, rule 30.8's inclusion in the *Federal Register*'s publication of the proposed rules suggests that the Commission may be inclined to apply that

As with the 37.6-40 GHz bands, for example, the Commission should make large contiguous blocks of spectrum available. Where possible, the Commission should subdivide each of the new millimeter wave bands into wide channels of 200 megahertz blocks.<sup>29</sup> Establishing large channel blocks will enable licensees to harness the full potential of the bands, including “enhanc[ing] system performance” and “deliver[ing] the ultra-high throughputs required to meet projected [5G] data demand growth.”<sup>30</sup> Likewise, the Commission should assign licenses with reasonably long ten-year terms and renewal expectancies for licensees that meet applicable performance requirements. Doing so will attract investment and encourage all forms of innovation, even experiments that may be time-intensive. In a similar vein, the Commission should adopt power limits and antenna height rules that align with the rules for the 28 GHz and 37.6-40 GHz bands. Launching 5G technologies and services will already be a

---

new rule to the bands being considered in the *FNPRM*. See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services*, 81 Fed. Reg. 58270, 58301 (Aug. 24, 2016). As an initial matter, the Commission has not afforded stakeholders sufficient notice and opportunity to comment on rule 30.8 in this proceeding. Rule 30.8 was not in the *NPRM*, and neither the *NPRM* nor the *FNPRM* sought comment on its varied requirements or its implementation, which raise difficult questions. It is unclear whether the Commission is considering applying the rule to the bands under consideration in the *FNPRM*. To be clear, CTIA opposes cybersecurity mandates. Indeed, such ill-considered security obligations are premature, may stifle innovation and will have other unintended consequences. Prescriptive security regulations like rule 30.8 are also unnecessary. Industry is actively engaged in a range of efforts, in coordination with the FCC, other federal agencies, and international standards groups, to address network and device security in the 5G environment. The Commission should continue to promote these kinds of collaborative multi-stakeholder efforts because “[t]he pace of innovation on the Internet is much, much faster than the pace of a notice-and-comment rulemaking.” Remarks of FCC Chairman Tom Wheeler, American Enterprise Institute (June 12, 2014), [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-327591A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-327591A1.pdf).

<sup>29</sup> See *id.* ¶ 95 (creating seven 200 megahertz blocks out of the 39 GHz band); *id.* ¶ 123 (dividing the upper 37 GHz band in 200 megahertz blocks). To the extent a particular band cannot accommodate 200 megahertz channels, the Commission should endeavor to make 100 megahertz blocks available.

<sup>30</sup> AT&T NPRM Reply Comments at 8.

challenging endeavor and the Commission should not add layers of regulatory complexity.

Establishing a simple and harmonious regulatory regime throughout the millimeter wave bands will allow licensees to focus on 5G deployment.

**IV. THE COMMISSION SHOULD ENSURE THAT THE 40-42 GHZ, 50 GHZ, AND 70/80 GHZ BANDS ARE ALLOCATED WITH THE FEWEST POSSIBLE ENCUMBRANCES.**

Since launching this proceeding, the Commission has moved rapidly to repurpose spectrum for more efficient uses and facilitate the 5G revolution. As the Commission has recognized, making this new spectrum available and transitioning to 5G “in the near term” will help secure the United States’ global position as a wireless visionary.<sup>31</sup> After all, as Commissioner Clyburn has stated, “the Commission is on the cusp of something ‘big’ when it comes to the deployment of 5G wireless services.”<sup>32</sup> CTIA believes that the Commission can best achieve these goals by elevating all of the millimeter wave bands to their fullest potential. With this guiding principle in mind, the Commission should explore the 40-42 GHz band’s potential for mobile uses, move quickly to free the 50 GHz band for mobile services, and retain an enhanced version of the 70/80 GHz band’s existing licensing framework.

*40-42 GHz band.* Although the Commission proposed reallocating the 42-42.5 GHz band for mobile uses, the *FNPRM* does not make a similar proposal for the 40-42 GHz band.<sup>33</sup> CTIA notes that the Agenda Item for the next World Radiocommunication Conference (“WRC-19”) identifies the entire 37-42.5 band as a candidate for study by the International

---

<sup>31</sup> *Order & FNPRM* ¶ 7.

<sup>32</sup> Statement of FCC Commissioner Mignon L. Clyburn, Senate Committee on Commerce, Science, and Transportation, *Oversight of the Federal Communications Commission*, at 2 (Sept. 15, 2016), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2016/db0915/DOC-341262A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0915/DOC-341262A1.pdf).

<sup>33</sup> *See id.* ¶¶ 404-408.

Telecommunication Union (“ITU”) for mobile services.<sup>34</sup> Consistent with this Agenda Item, the Commission should consider reallocating the entire 40-42.5 GHz band for mobile uses rather than focusing solely on the 42-42.5 GHz band. The Commission should not miss the opportunity to make a contiguous 5.5 gigahertz block of spectrum (from 37 to 42.5 GHz) available for exclusive, licensed use.<sup>35</sup> As commenters made clear, access to these kinds of large contiguous blocks of spectrum will be key to leveraging the millimeter wave bands in support of 5G systems.<sup>36</sup> As the international community prepares for mobile use of the 40-42 GHz band, the Commission should as well by working with interested stakeholders to evaluate the suitability of the band for mobile uses.

*50 GHz band.* The Commission should not delay acting on its 50 GHz band proposals by launching ancillary proceedings. Recently, however, the Commission released a Public Notice seeking comment on Boeing’s Petition for Rulemaking to allocate and authorize additional uplink spectrum for the Fixed-Satellite Service (“FSS”) in the 50.4-51.4 GHz and 51.4-52.4 GHz bands.<sup>37</sup> Because this spectrum is being actively explored for 5G services in this proceeding, the Commission should not entertain a separate proceeding to authorize additional FSS uplink use without considering the impact on terrestrial services.<sup>38</sup> At a minimum, Boeing should be

---

<sup>34</sup> See *World Radiocommunication Conference 2015 (WRC-15): Presentation to the FCC Open Meeting*, Report, at 6-7 (Int’l Bur. Dec. 17, 2015), [http://transition.fcc.gov/Daily\\_Releases/Daily\\_Business/2015/db1217/DOC-336915A1.pdf](http://transition.fcc.gov/Daily_Releases/Daily_Business/2015/db1217/DOC-336915A1.pdf).

<sup>35</sup> CTIA notes that the underlying Report and Order designated 37 – 37.6 GHz for sharing between federal and non-federal operations. As CTIA urges *infra* Section VII, the Commission can retain an exclusive use, licensed framework while still accommodating federal sharing.

<sup>36</sup> See, e.g., AT&T NPRM Reply Comments at 8; Nokia NPRM Comments at 15-21; Comments of CTIA, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 21-22 (Jan. 28, 2016) (“CTIA NPRM Comments”).

<sup>37</sup> *Petition for Rulemaking Filed*, Public Notice, RM-11773 (Sept. 16, 2016) (“Boeing PN”).

<sup>38</sup> See *Order & FNPRM ¶¶ 418-423*.

required to demonstrate, with concrete analysis, how the 50 GHz band could be used for satellite uplink services without causing harmful interference to 5G services. Boeing's analysis should be included as part of the record in the instant proceeding so that the Commission may make a fully informed decision about how to allocate the 50 GHz band. A separate rulemaking proceeding would be redundant and could only delay 5G deployment.

*70/80 GHz bands.* In 2003, the Commission adopted a *Report and Order* establishing service rules to promote non-Federal development and use of the millimeter wave spectrum in the 70 and 80 GHz bands.<sup>39</sup> Since then, existing terrestrial licensees have successfully used these spectrum bands for important fixed services, like backhaul, without any interference problems. CTIA commends the Commission for establishing such a successful licensing framework in the 70 and 80 GHz bands. Over the past 13 years, industry has relied on these bands for fixed services and CTIA's members expect that use of the 70/80 GHz bands for fixed backhaul will expand with the deployment of 5G services. Accordingly, CTIA believes that the Commission should largely retain its existing 70/80 GHz licensing framework. While CTIA and its members are actively engaged in the SAS experiment in the 3.5 GHz band, we strongly urge the Commission to assess the results of the SAS model in that band before exporting the model to additional bands. In particular, it should not experiment with implementing a SAS-type regime in the 70/80 GHz bands, as doing so could delay deployments, or worse, endanger the viability of mobile services in the spectrum.<sup>40</sup>

---

<sup>39</sup> *Allocations and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands*, Report and Order, 18 FCC Rcd 23318 (2003).

<sup>40</sup> *See Part VII, infra* (discussing the problems associated with employing a SAS mechanism in the millimeter wave bands).

Rather than experimenting with untested licensing frameworks, the Commission should consider adjusting its technical rules in the 70/80 GHz bands to allow 5G deployments to flourish. Specifically, the Commission should relax the allowed beamwidth for antennas below ten meters to 3 degrees. As the Commission notes, it recently opened another proceeding to consider waiver requests that would increase the allowable beamwidth in portions of the 70/80 GHz bands to 2.2 degrees.<sup>41</sup> The record evidence collected so far confirms that relaxed beamwidth limits would help promote the kinds of multiple-input, multiple-output (“MIMO”) base station deployments that will likely support 5G services.<sup>42</sup> Raising the beamwidth limit also would facilitate the rapid deployment of the small antennas necessary for the low-level, short paths required to connect 5G systems.<sup>43</sup> In short, relaxing the beamwidth limits for antennas below ten meters to three degrees would “create an incentive for much more extensive deployment” as 5G unfolds.<sup>44</sup>

The Commission also should consider enhancing the existing sharing database that manages the 70/80 GHz bands to accommodate new mobile services. As the Commission notes, the current database management system “has been effectively used for over a decade to facilitate coexistence” between commercial and governmental systems.<sup>45</sup> The database could be modified to account for new, mobile uses in the 70/80 GHz bands while still fully protecting

---

<sup>41</sup> See *FNPRM ¶ 436; Wireless Telecommunications Bureau Seeks Comment On Requests Of Aviat Networks and CBF Networks, Inc. D/B/A Fastback Networks For Waiver Of Certain Antenna Requirements In the 71-76 and 81-86 GHz Bands*, Public Notice, 30 FCC Rcd 10961 (Oct. 13, 2015).

<sup>42</sup> *Order & FNPRM ¶ 436.*

<sup>43</sup> Reply Comments of AT&T, WT Docket No. 15-244, at 3 (Nov. 30, 2015).

<sup>44</sup> Comments of T-Mobile USA, Inc., WT Docket No. 15-244, at 2 (Mar. 12, 2015).

<sup>45</sup> *Order & FNPRM ¶ 439.*

incumbent fixed microwave links. By preserving and strengthening the existing 70/80 GHz management database, the Commission will help ensure that these bands are put to their most efficient 5G use.

**V. THE COMMISSION SHOULD ADOPT A FLEXIBLE APPROACH TO PERFORMANCE REQUIREMENTS.**

Performance requirements should be crafted to reflect the evolving nature of 5G services and technologies so that licensees retain the flexibility needed to deploy innovative systems. Accordingly, the Commission adopted a series of performance requirements tailored to different types of services that licensees may choose to offer in the millimeter wave bands.<sup>46</sup> In particular, the *Order* prescribes performance requirements for mobile and point-to-multipoint services, fixed services, and hybrid services.<sup>47</sup> These three categories of performance metrics should be used to evaluate the full range of 5G services. The Commission should not complicate performance review by adopting a separate rubric for evaluating IoT-type services. Instead, IoT services can and should be evaluated under the fixed, mobile, and/or hybrid frameworks that the Commission already adopted. Developing a separate metric for evaluating IoT deployments at this stage would add unnecessary complexity to the Commission’s proposed performance requirement framework. Moreover, because it is unclear what form IoT deployments will ultimately take, crafting unique measurement milestones would be both difficult and premature.

For similar reasons, the Commission should not strain to develop overly granular performance metrics. Flexibility is necessary to accommodate the range of services and

---

<sup>46</sup> See *id.* ¶ 203.

<sup>47</sup> See *id.* ¶¶ 206, 208, 210.

deployments that 5G contemplates.<sup>48</sup> Indeed, the Commission should encourage licensees to experiment with groundbreaking technologies and deployments to push 5G to its full potential. As the Commission recognizes, affording licensees “enough flexibility to accommodate both traditional services and . . . innovative services or deployment patterns” will be essential to fostering a thriving and dynamic 5G ecosystem.<sup>49</sup> Moreover, because technology and network planning have not yet been finalized for 5G, CTIA does not believe that developing granular performance metrics for certain hybrid buildouts would even be feasible at this time.

Under the flexible approach to performance requirements outlined in the *Order*, licensees that meet the prescribed mobile or fixed performance standards automatically qualify for license renewal.<sup>50</sup> Licensees that do not meet either the fixed or the mobile performance milestones would be evaluated on a case-by-case basis, particularly if the licensee has constructed a hybrid network that relies upon both mobile and fixed components. The Commission’s case-by-case analysis should be guided by the unique characteristics of millimeter wave spectrum and the services deployed therein. For example, licensees may choose to deploy both mobile/transportable units and fixed links for backhaul to the Internet. This kind of hybrid deployment should meet the Commission’s performance requirement so long as a significant number of access points have been deployed and there is fixed backhaul—connected via millimeter wave spectrum—that is associated with the network.

To provide some certainty and guidance for licensees, the Commission should provide a representative list of flexible options that would be sufficient to satisfy its hybrid case-by-case

---

<sup>48</sup> See AT&T NPRM Comments at 22-23 (noting that the Commission’s approach to performance requirements may need to evolve as 5G deployments take shape).

<sup>49</sup> *Order & FNPRM* ¶ 203.

<sup>50</sup> *See id.*

analysis. In doing so, the Commission should make clear that the safe harbor list is non-exhaustive and may change over time as technology advances. Eventually, the Commission's safe harbor list may encompass a wide range of performance metrics designed to reflect the anticipated diversity of 5G applications. For the time being, CTIA submits that the safe harbor list should include the following options:

- *Coverage/Link Combination.* Licensees that meet half of the coverage metrics required for mobile services and half of the link milestones required for fixed services should qualify for a renewal expectancy. For example, in a market with a population of 268,000, a licensee that provides two fixed links and 20 percent coverage would fall within the safe harbor and satisfy the Commission's hybrid performance requirement. Under this framework, the fixed link requirement could scale up with population—*i.e.*, a market with a population of 500,000 would require four links and 20 percent coverage, a market with a population of one million would require eight links and 20 percent coverage, and so forth.
- *Average Connections.* Licensees that can show a weekly average of 1,000 connections from either mobile or fixed stations in a market with a population of 10,000 should fall within a safe harbor for license renewal. This requirement could also scale up with population. For example, a market with a population of 100,000 would require 10,000 connections while a market with a population of one million would require 100,000 connections.
- *IP Sessions.* Licensees that can show a weekly average of 1,000 IP sessions from either fixed or mobile stations in a market with a population of 10,000 should satisfy the Commission's hybrid performance requirement. Again, this requirement could scale up with population such that, for example, a market with a population of 100,000 would require a showing of 10,000 IP session and a market with a population of one million would require 100,000 IP sessions.
- *Access Point Deployment.* Licensees that deploy 500 fixed or mobile access points in a market with a population of 50,000 should meet the Commission's performance requirements. As with the other safe harbors, the access point requirement could scale up with population—*e.g.*, markets with a population of 100,000 could be required to show 1,000 access points while markets with a population of one million could be required to show 10,000 deployed access points to fall within the safe harbor.

Although each safe harbor should be sufficient to ensure automatic license renewal, the Commission should make clear that the compliance options outlined above will be neither mandatory nor cumulative. CTIA believes that a flexible, case-by-case approach guided by the

representative safe harbors proposed herein will encourage investment, deployment, and innovation in the millimeter wave bands. Indeed, flexible performance requirements best reflect the millimeter wave bands' ability to host a variety of services and complement more traditional spectrum uses.

**VI. A “USE IT OR SHARE IT” REQUIREMENT WOULD HARM 5G INVESTMENT, STIFLE INNOVATION, AND DELAY DEPLOYMENT.**

CTIA continues to oppose any form of “use it or share it” requirements in the millimeter wave bands.<sup>51</sup> The “use it or share it” approach would threaten to redistribute a licensee’s exclusively licensed spectrum a mere five years into the license term if it is not being “used.” In light of the nascent nature of 5G technology, it would be premature to implement a “use it or share it” framework in the spectrum bands above 24 GHz. As the record in this proceeding makes clear, many questions remain about how the millimeter wave bands will ultimately be put to use.<sup>52</sup> With these challenging technical questions still unresolved, the Commission should not overly complicate the millimeter wave bands with a sharing requirement. Instead, it should ensure that licensees are given the time needed to develop, test, and deploy 5G technologies without the fear of stranding capital.

Implementing a “use it or share it” mandate would wreak havoc on the millimeter wave bands, thwarting the Commission’s central goal of facilitating the transition to 5G. It would create uncertainty, undermine investment, and stifle innovation. As commenters have made

---

<sup>51</sup> See CTIA NPRM Comments at 26-27.

<sup>52</sup> See, e.g., Verizon NPRM Comments at 1-2; Comments of the Telecommunications Industry Association, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 3 (Jan. 28, 2016) (noting the “many unanswerable questions” about 5G systems at this time).

clear, deploying 5G services will be complex.<sup>53</sup> Licensees will need unfettered access to their licensed spectrum to test new technologies, experiment with novel deployments, and transform today's ambitious vision of 5G into reality. Creating an environment characterized by certainty, predictability, and transparency will thus be key to promoting investment and fostering innovation throughout the millimeter wave bands. But adopting a "use it or share it" requirement promises to do just the opposite. Licensees would be at risk of being unable to access and use their licensed spectrum when and where they need it. With this level of uncertainty, Nokia and others have advised that prospective investors may be discouraged from purchasing millimeter wave rights if they will be asked to share the spectrum via untested sharing mechanisms.<sup>54</sup> Moreover, a "use it or share it" requirement would stymie innovation as licensees may be forced to deploy a network in a rushed and inefficient manner simply to preserve their license rights.<sup>55</sup>

From a practical perspective, implementing a "use it or share it" framework would be challenging. As a threshold matter, the Commission would need to define when spectrum is considered "in use" such that the sharing requirement would not be triggered. This definitional hurdle will be difficult, if not impossible, to clear. In some cases, for example, managing a very high quality of service requirement may cause spectrum "use" to appear very low during certain intervals when capacity is actually being held in reserve for peak demand periods.<sup>56</sup> The

---

<sup>53</sup> See AT&T NPRM Reply Comments at 6-7 (explaining that leveraging the millimeter wave bands for mobile uses will require a number of advanced technologies).

<sup>54</sup> See, e.g., Nokia NPRM Comments at 20; Qualcomm NPRM Comments at 13; AT&T NPRM Reply Comments at 10; Verizon NPRM Comments at 20 ("First-deployers of brand new technologies in brand new bands will need operational flexibility, not the overhanging risk that their investments may become impaired by third parties using the spectrum.").

<sup>55</sup> See, e.g., Letter from Scott K. Bergmann, Vice President, Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 1 (July 7, 2016).

<sup>56</sup> AT&T NPRM Comments at 21.

Commission’s approach to spectrum “use” would need to account for this kind of nuanced scenario. Further, as industry continues to explore new ways of leveraging the millimeter wave bands to support 5G systems, novel spectrum “uses” will continue to emerge. How the Commission chooses to identify spectrum that is “in use” could thus preclude highly beneficial uses of the millimeter wave bands, with far-reaching implications for 5G development and deployment.

Despite the strong record evidence of the problems inherent in a “use it or share it” requirement, sharing supporters have not shown that sharing mechanisms are either feasible or necessary in the millimeter wave environment.<sup>57</sup> In fact, sharing proponents have failed to cite analyses or studies that show that implementing a sharing framework would be feasible in the millimeter wave bands. Nor have sharing advocates offered any concrete analysis of how a sharing framework would work in a 5G environment. Proponents cannot offer such analyses because sharing mechanisms are still untested and 5G is a new and evolving frontier. Some sharing advocates appear to concede as much, admitting that sharing technologies and concepts are still “gaining acceptance.”<sup>58</sup>

Some sharing supporters have even called upon the Commission to administer the “use it or share it” paradigm through novel “hybrid” sharing systems. Under Public Knowledge’s proposal, for example, millimeter wave spectrum would be shared by a combination of a private

---

<sup>57</sup> See Comments of Facebook Inc., GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 3-4, 6-7 (Jan. 26, 2016) (expressing general support for sharing without considering how it may impact deployment, exacerbate interference issues, or deter investment); Reply Comments of Microsoft Corp., GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at 12-13 (Feb. 26, 2016) (stating, without support, that sharing poses “little risk of harmful interference to existing licensees”).

<sup>58</sup> See Comments of Federated Wireless, Inc., GN Docket No. 14-177, IB Docket Nos. 15-256 and 97-95, WT Docket No. 10-112, and RM-11664, at ii, 5 (Jan. 27, 2016).

commons rule, a SAS, and “open protocols,” such as those permitted under Part 15 of the Commission’s rules.<sup>59</sup> The Commission should reject this proposal. Aside from being overly complex, untested, and unnecessary, this kind of approach would impose significant administrative burdens on licensees. When a licensee became ready to roll-out 5G deployments, for example, scarce resources would first be wasted on onerous spectrum clearing efforts. Complexity and delay would inevitably ensue.

In any event, implementing a “use it or share it requirement” is unnecessary. As CTIA has explained, the Commission already has made a substantial amount of millimeter wave spectrum available for experimentation with sharing techniques.<sup>60</sup> Moreover, the Commission’s existing private commons framework and spectrum leasing policies provide appropriate paths for non-licensees to obtain access to unused millimeter wave spectrum.<sup>61</sup> Put simply, the Commission should refrain from adopting an unproven sharing-intensive framework in the millimeter wave bands. Instead, the Commission should allow its proven and successful exclusive use licensing framework to facilitate the development and deployment of 5G.

## **VII. THE COMMISSION SHOULD NOT IMPLEMENT A SAS-TYPE SHARING MECHANISM IN THE 37-37.6 GHZ BAND.**

Although the Commission has decided to allow for Federal sharing of the 37-37.6 GHz band, it has not yet identified an appropriate sharing mechanism. CTIA continues to oppose

---

<sup>59</sup> Letter from Harold Feld, Senior Vice President, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, IB Docket Nos. 12-340, 13-213, WT Docket Nos. 16-149, 16-181, 12-354, ET Docket Nos. 13-49, 15-105, RM-11681, RM-11771, RM-11768, at 2 (Sept. 15, 2016).

<sup>60</sup> See Part III, *supra* (describing the spectrum already available for experimentation with unlicensed and sharing concepts).

<sup>61</sup> See, e.g., 47 C.F.R. § 1.9080 (establishing a cooperative mechanism for making licensed spectrum available to users employing advanced technologies without the need for individual spectrum leasing arrangements).

implementing a SAS-type regime in the 37-37.6 GHz band. The Commission should instead auction this 600 megahertz of spectrum and manage sharing in the same way that it approached the AWS-3 spectrum band. Specifically, commercial millimeter wave licensees could be required to coordinate with Federal users in pre-determined coordination zones prior to launching operations.<sup>62</sup> This flexible approach would allow Federal and commercial entities to craft appropriate solutions to accommodate different uses of the band, just as they successfully collaborated in the AWS-3 bands, without the needless complexity and uncertainty associated with SAS-type models. The Commission should build on this success and again allow the Federal government and the commercial wireless industry to work collaboratively to construct the appropriate sharing framework. Allowing interested stakeholders to develop, through face-to-face discussions among technical personnel, a sharing framework that would govern the use of the 37-37.6 GHz band would replicate the process used so effectively in the AWS-3 context.

In contrast, as commenters have made clear, developing and implementing a SAS regime in the millimeter wave bands will delay 5G deployment.<sup>63</sup> The Commission's 3.5 GHz proceeding highlights the significant amount of time it will take to establish a dynamic SAS mechanism in the 37-37.6 GHz band. In 2012, the Commission identified spectrum between 3500 and 3700 MHz that it proposed to redistribute through a novel, three-tiered sharing regime. Four years later, however, development of that SAS model remains on-going and the spectrum still has not been made available for use. Indeed, the experimental SAS regime has yet to be deployed in any real-world environment. It would defy logic to extend the SAS model to the

---

<sup>62</sup> See *The Federal Communications Commission and the National Telecommunications and Information Administration: Coordination Procedures in the 1695-1710 MHz and 1755-1780 MHz Bands*, Public Notice, GN Docket No. 13-185, at 4-5 (July 18, 2014).

<sup>63</sup> See, e.g., Verizon NPRM Comments at 24-25; Intel NPRM Comments at 22; AT&T NPRM Comments at 14.

millimeter wave bands before it has been successfully deployed in any frequency band.<sup>64</sup> As Commissioner O’Rielly correctly observed, one way to “stall 5G deployment is to impose untested licensing regimes on the new bands identified for mobile use.”<sup>65</sup> When it comes to 5G deployments, time is of the essence. And there is no time for novel sharing experiments in these critical millimeter wave bands; the spectrum is simply too important.

Moreover, implementing a SAS-type mechanism in the lower 37 GHz band would stifle innovation. Sharing mechanisms can create serious obstacles for launching new services. As Intel has advised, the SAS is nothing more than an “unproven experimental concept” that requires additional development and refinement before it may be deployed.<sup>66</sup> Innovators may be precluded from deploying certain technologies and services in the bands just to accommodate SAS needs. The Commission should not artificially limit the millimeter wave spectrum’s potential uses before 5G even launches. Nor should it introduce unnecessary complexity into the 37 GHz band, particularly when, as described above, 14 gigahertz of millimeter wave spectrum will be available for unlicensed uses and experimentation in the 57-71 GHz band.

## **VIII. CONCLUSION.**

Millimeter wave spectrum holds great potential for addressing spectrum demand and launching new 5G services. CTIA applauds the Commission for its hard work identifying millimeter wave spectrum that can be reallocated for mobile uses. Through the *Order*, the

---

<sup>64</sup> Even if the SAS model is eventually found to be feasible in the 3.5 GHz band, scaling the framework from its 3.5 GHz form and adapting it to the lower 37 GHz band may be difficult and time consuming, if not impossible.

<sup>65</sup> Remarks of Michael O’Rielly, FCC Commissioner, Before Hogan Lovells’ Technology Forum: *The 5G Triangle*, at 4 (May 25, 2016), [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-339558A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-339558A1.pdf).

<sup>66</sup> Intel NPRM Comments at 22.

Commission has laid the groundwork for unleashing critical spectrum for mobile uses and jumpstarting the transition to 5G services. The Commission should continue full speed ahead, setting an auction date for those bands while also moving forward to develop rules for the bands proposed for reallocation in the *FNPRM*. In the bands set forth in the *FNPRM*, the Commission should adhere to its proven policies of flexible, exclusive-use licensing, adopting a framework that prioritizes certainty and flexibility. Likewise, it should refrain from burdening the millimeter wave bands with cumbersome sharing requirements and untested sharing mechanisms. By adopting clear service and licensing rules consistent with the proposals set forth herein, the Commission will improve wireless service, facilitate the IoT revolution, and secure U.S. leadership in mobile technologies and services well into the future.

Respectfully submitted,

By: /s/ Kara D. Romagnino

Kara D. Romagnino  
Director, Regulatory Affairs

Thomas C. Power  
Senior Vice President, General Counsel

Scott K. Bergmann  
Vice President, Regulatory Affairs

Paul Anuskiewicz  
Vice President, Spectrum Planning

Brian M. Josef  
Assistant Vice President, Regulatory Affairs

**CTIA**  
1400 16<sup>th</sup> Street, NW, Suite 600  
Washington, D.C. 20036  
(202) 785-0081

September 30, 2016