

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

In the Matter of:)	
)	
Use of Spectrum Bands Above 24 GHz For)	GN Docket No. 14-177
Mobile Radio Services)	
)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95,)	WT Docket No. 10-112
and 101 To Establish Uniform License Renewal,)	
Discontinuance of Operation, and Geographic)	
Partitioning and Spectrum Disaggregation Rules)	
and Policies for Certain Wireless Radio Services)	

COMMENTS OF CTIA

Thomas C. Power
Senior Vice President and General Counsel

Scott K. Bergmann
Senior Vice President, Regulatory Affairs

Paul Anuszkiewicz
Vice President, Spectrum Planning

Kara R. Graves
Director, Regulatory Affairs

Jennifer L. Oberhausen
Director, Regulatory Affairs

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

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COMMENTS OF CTIA

CTIA¹ respectfully submits these comments in response to the Third Further Notice of Proposed Rulemaking seeking comment on continuing efforts by the Federal Communications Commission (“Commission”) to make available millimeter wave spectrum at or above 24 GHz.²

I. INTRODUCTION AND SUMMARY.

The Commission has taken expeditious action throughout the *Spectrum Frontiers* proceeding to make additional high-band spectrum available for terrestrial wireless use. CTIA is therefore encouraged by the Chairman’s proposal to auction three additional spectrum bands in 2019, which will build on the upcoming high-band spectrum auctions of the 28 GHz and 24 GHz

¹ CTIA® (www.ctia.org) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21st 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 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.

² *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking and Order, GN Docket No. 14-177, *et al.*, FCC 18-73 (rel. June 8, 2018) (“*Spectrum Frontiers Third Order*” or “*Spectrum Frontiers Third FNPRM*”).

bands.³ CTIA also continues to support the Commission’s examination of additional bands above 24 GHz to determine their suitability for flexible wireless use. The Commission’s identification and evaluation of new spectrum bands for additional uses and opportunities will directly contribute to continued U.S. global wireless leadership, spur economic growth, and create jobs across the country.

Specifically, CTIA supports a number of the proposals in the *Spectrum Frontiers Third FNPRM*. CTIA welcomes the Commission’s proposal to allow use of the 25.25-27.5 GHz (“26 GHz”) band for flexible fixed and mobile services and agrees with the Commission that geographic area licensing should be done on a Partial Economic Area (“PEA”) basis for the 26 GHz band. Given the importance of this band to 5G services, CTIA suggests applying the already tested and successful Part 30 licensing scheme, rather than exploring experimental approaches to licensing. CTIA similarly supports utilizing PEA geographic licenses for the 42-42.5 GHz (“42 GHz”) band, and agrees with the Commission that 100-megahertz spectrum block sizes will encourage the buildout of new and innovative services in the band, including 5G. CTIA urges the Commission to adopt a straightforward licensing and sharing mechanism for the 37-37.6 GHz (“Lower 37 GHz”) band, rather than institute varied licensing schemes for point-to-point, base station, and site cluster licenses. The Commission should also refrain from adopting licensing rules for Fixed Satellite Service (“FSS”) earth stations in the 50.4-51.4 GHz band before finalizing action on service rules for Upper Microwave Flexible Use Service (“UMFUS”) in that band.

³ See FCC Chairman Ajit Pai, *Coming Home*, FCC BLOG (July 11, 2018), <https://www.fcc.gov/news-events/blog/2018/07/11/coming-home>; see also *Spectrum Frontiers Third Order*, Statement of Chairman Ajit Pai; *id.*, Statement of Commissioner Michael O’Rielly; *id.*, Statement of Commissioner Jessica Rosenworcel.

In addition, because a number of spectrum bands above 24 GHz will have extensive coexistence between government and commercial licensees, CTIA recommends that the Commission adopt guiding principles for sharing between these entities. Establishing a defined rubric will allow government and commercial licensees the certainty needed to develop and deploy services in these spectrum bands.

The Commission's commitment to identifying and evaluating new spectrum bands for additional uses and opportunities has directly contributed to U.S. global leadership on wireless issues. By taking additional steps in this proceeding, the Commission will ensure critical spectrum is put to use to support U.S. leadership in the development and implementation of new and innovative services, including the deployment of 5G for American consumers.

II. ADDITIONAL SPECTRUM RESOURCES ARE NECESSARY TO MAINTAIN U.S. WIRELESS LEADERSHIP, SPUR ECONOMIC GROWTH, AND CREATE JOBS.

A. The Accelerating Growth of the U.S. Wireless Industry Has Created Tremendous Economic Opportunities.

Wireless broadband adoption and use has increased exponentially in recent years. By the end of 2017, total estimated wireless subscriber connections increased to 400.2 million, up from 395.9 million in 2016.⁴ Much of this growth is attributable to the now 126.4 million data-only devices in use, a 19.5 percent increase over 2016 and nearly 2.5 times the number of data-only devices deployed in 2013.⁵ In fact, data-only devices such as connected cars and Internet of

⁴ *CTIA Wireless Industry Indices Report* (2018).

⁵ *Id.*

Things (“IoT”) devices accounted for 90 percent of new net wireless connection adds in the first quarter of 2018.⁶

The rapid increase in wireless connections and data-only devices has created a corresponding explosion in data usage. In 2017, mobile data traffic totaled 15.7 trillion megabytes (“MB”), an increase of 14 percent over 2016, and 40 times greater than in 2010.⁷⁸ The average smartphone user consumed 5.1 gigabytes (“GB”) of data per month in 2017, a 30.7 percent increase over 2016, and a 2,844 percent increase over 2010 usage levels.⁹ And this growth is projected to continue into the future—by 2021, Cisco anticipates that mobile data traffic in the U.S. will grow five-fold from 2016, twice as fast as U.S. fixed Internet traffic.¹⁰

This growth has been fueled, in large part, by U.S. leadership in developing and deploying 4G technology. As a result of the U.S. taking the leading role on 4G deployment, the country also reaped huge economic gains, including the creation of millions of new jobs. An analysis by Recon Analytics indicates that the U.S. wireless industry GDP grew from \$195.5 billion in 2011 to \$332.9 billion in 2014, when 4G reached 40 percent penetration in the U.S., with 4G leadership directly accounting for \$43.6 billion of this increase.¹¹ By 2016, the U.S.

⁶ Mike Dano, *90% of Industry’s Net Adds Now Coming from Connected Cars, IoT: Chetan Sharma*, FIERCEWIRELESS (May 31, 2018), www.fiercewireless.com/iot/90-industry-s-net-adds-now-coming-from-connected-cars-iot-chetan-sharma.

⁷ *CTIA Wireless Industry Indices Report* (2018).

⁸ *Id.*

⁹ *Id.*

¹⁰ Cisco VNI Mobile Forecast Highlights, 2016-2021, http://www.cisco.com/c/dam/assets/sol/sp/vni/forecast_highlights_mobile/index.html#~Country (last visited Sept. 10, 2018).

¹¹ *How America’s Leading Position in 4G Propelled the Economy*, RECON ANALYTICS, at 9 (Apr. 16, 2018), https://api.ctia.org/wp-content/uploads/2018/04/Recon-Analytics_How-Americas-4G-LeadershipPropelled-US-Economy_2018.pdf.

wireless industry contributed \$475 billion to the economy annually, or 2.6 percent of total U.S GDP, with leadership in 4G accounting for a nearly \$100 billion increase in annual GDP.¹² The launch of 4G in the United States also increased total wireless-related jobs by 84 percent from 2011 to 2014.¹³ As a result, the wireless industry currently supports 4.7 million American jobs, with each direct wireless job resulting in a total employment multiplier effect of 7.7x.¹⁴ Moreover, winning the 4G race helped secure America's leading position in key parts of the global wireless ecosystem, including the app economy.¹⁵

Given the overwhelming benefits associated with the growth of 4G, it is imperative that the U.S. retain its wireless leadership as the transition to 5G networks occurs. Our nation's wireless industry is expected to invest \$275 billion into building next-generation 5G networks,¹⁶ resulting in a projected three million new jobs and boosting GDP by \$500 billion.¹⁷ The transition to 5G networks and services also will accelerate growth among the IoT, as consumers and businesses adopt new applications and uses that will enable connected homes, cities, cars, and lives. For example, Ericsson estimates that cellular IoT connections will reach 213 million

¹² *Id.*

¹³ *Id.* at 10.

¹⁴ *How the Wireless Industry Powers the U.S. Economy*, ACCENTURE STRATEGY (Apr. 2018), <https://api.ctia.org/wpcontent/uploads/2018/04/Accenture-Strategy-Wireless-Industry-Powers-US-Economy-2018-POV.pdf>.

¹⁵ *How America's Leading Position in 4G Propelled the Economy*, RECON ANALYTICS, at 11-12 (Apr. 16, 2018), https://api.ctia.org/wp-content/uploads/2018/04/Recon-Analytics_How-Americas-4G-LeadershipPropelled-US-Economy_2018.pdf.

¹⁶ *CTIA Wireless Industry Indices Report* (2018).

¹⁷ *The Global Race to 5G*, CTIA, at 2 (Apr. 2018), <https://api.ctia.org/wp-content/uploads/2018/04/Raceto-5G-Report.pdf>.

by 2022, accounting for more than 30 percent of all cellular connections.¹⁸ The increase in connected devices due to 5G could create as much as \$305 billion in annual health system savings,¹⁹ and the Smart City solutions facilitated by 5G could produce \$160 billion in benefits and savings through reductions in energy usage, traffic congestion, and fuel costs.²⁰

B. The Commission Must Ensure that Providers Have the Necessary Spectrum Resources to Support New 5G Services.

Maintaining U.S. leadership in wireless and securing the lead in the race to 5G will require the Commission to prioritize auctioning new millimeter wave spectrum to keep pace with other countries. China's wireless market is projected to reach \$180.5 billion by 2026, a nearly 50 percent growth over its 4G market,²¹ and approximately 430 million 5G connections by 2025.²² In South Korea, a recently completed auction of 2400 megahertz of 28 GHz spectrum is expected to facilitate the deployment of 5G infrastructure in 2019.²³

¹⁸ *Ericsson Mobility Report*, ERICSSON, at 33 (June 2017), <https://www.ericsson.com/assets/local/mobility-report/documents/2017/ericsson-mobility-report-june-2017-north-america.pdf>.

¹⁹ *The Digital Revolution comes to US Healthcare*, GOLDMAN SACHS (June 2015) <https://www.anderson.ucla.edu/Documents/areas/adm/acis/library/DigitalRevolutionGS.pdf>.

²⁰ *How 5G Can Help Municipalities Become Vibrant Smart Cities*, ACCENTURE STRATEGY (Jan. 2017), <https://api.ctia.org/docs/default-source/default-document-library/how-5g-can-help-municipalities-become-vibrant-smart-cities-accenture.pdf>.

²¹ Gordon Watts, *5G becomes the latest battlefield in US-China tech war*, ASIA TIMES (May 16, 2018), <http://www.atimes.com/article/5g-becomes-the-latest-battlefield-in-us-china-tech-war/>.

²² *5G in China: The Enterprise Story*, GSMA, at 8-9 (June 2018), <https://www.gsmainelligence.com/research/?file=077db5d3e96e47d392f6f48c808be526&download>.

²³ Juan Pedro Tomás, *SK Telecom, KT and LG U+ have secured spectrum in both 3.5GHz and 28GHz bands*, RCRWIRELESS (June 20, 2018), <https://www.rcrwireless.com/20180620/5g/south-korea-completes-5g-pectrum-auction-tag23>.

Although dozens of 5G trials have already been conducted across the United States,²⁴ and a number of wireless providers have announced anticipated 5G deployments,²⁵ additional spectrum resources are needed to unlock the full potential of the innovative services and technologies that 5G can enable and to ensure U.S. wireless leadership. CTIA supports Chairman Pai's commitment to 5G leadership²⁶ and believes that these proposals will propel the country on the path to continued global leadership on wireless deployment issues.

III. CTIA SUPPORTS THE PROPOSALS IN THIS PROCEEDING THAT WILL UNLOCK ADDITIONAL SPECTRUM BANDS FOR 5G.

A. The Commission Should Adopt Requirements for the 26 GHz Band that are Consistent with the Requirements Adopted for Adjacent Bands.

The 26 GHz band is a critical spectrum band for future 5G services. As the Commission noted, the 26 GHz band “has emerged as the leading candidate for 5G services” and would “be

²⁴ See, e.g., Intel Press Release, Intel Teams with AT&T, Ericsson on 5G Trial for DIRECTV NOW Service in Austin, Texas (June 27, 2017), <https://newsroom.intel.com/news/intel-teams-att-ericsson-5g-trial-for-directv-now-service-austin-texas/>; Aaron Pressman, *Verizon Testing Super Fast 5G Internet With Customers in 11 Cities*, FORTUNE (Feb. 22, 2017), <http://fortune.com/2017/02/22/verizon-testing-5g-11-cities/>; Qualcomm Press Release, Qualcomm, Ericsson and AT&T announce collaboration on 5G New Radio trials intended to accelerate wide-scale 5G deployments (Jan. 3, 2017), <https://www.qualcomm.com/news/releases/2017/01/03/qualcomm-ericsson-and-att-announce-collaboration-5g-new-radio-trials>; Sprint Press Release, Sprint Demonstrates 5G at Copa América Centenario (June 3, 2016), <http://newsroom.sprint.com/sprint-demonstrates-5g-at-copa-amrica-centenario.htm>.

²⁵ See, e.g., Jeremy Horwitz, *Verizon promises fixed 5G for Los Angeles by Q4 2018, mobile 5G by Q1 2019*, VENTUREBEAT (May 15, 2018), <https://venturebeat.com/2018/05/15/verizon-promises-fixed-5g-for-los-angeles-by-q4-2018-mobile-5g-by-q1-2019/>; T-Mobile Press Release, T-Mobile Building Out 5G in 30 Cities This Year ...and That's Just the Start (Feb. 26, 2018), <https://www.t-mobile.com/news/mwc-2018-5g>; Mike Dano, *Sprint promises to launch nationwide mobile 5G network in first half of 2019*, FIERCEWIRELESS (Feb. 2, 2018), <https://www.fiercewireless.com/5g/sprint-promises-to-launch-nationwide-mobile-5g-network-first-half-2019-and-to-raise-unlimited/>; AT&T, Inc. Press Release, AT&T to Launch Mobile 5G in 2018 (Jan 4, 2018), http://about.att.com/story/att_to_launch_mobile_5g_in_2018.html.

²⁶ Ajit Pai, Chairman, FCC, Remarks at the Wireless Infrastructure Association Connectivity Expo at 2 (May 23, 2018), <https://docs.fcc.gov/public/attachments/DOC-350919A1.pdf>.

suitable for flexible fixed and mobile services.”²⁷ Moreover, because of existing global interest in the 24.25-29.5 GHz range²⁸ and the fact that the Commission has already authorized flexible terrestrial use in the 24 GHz and 28 GHz bands,²⁹ moving forward with flexible-use rules in this band would allow equipment manufacturers to integrate the 26 GHz band into a wider tuning range. This approach would result in a number of key benefits for wireless consumers, including: (1) manufacturing economies of scale to allow the development of equipment that can cover multiple millimeter wave bands in a single radio, leading to lower prices; (2) international roaming with affordable user devices; and (3) accelerating the availability of equipment in newly authorized bands that share a tuning range with early-deployed bands.

CTIA supports harmonizing the 26 GHz band with adjacent bands by employing geographic area licensing on a PEA basis in 100-megahertz license block sizes.³⁰ CTIA also strongly supports the use of Part 30 for licensing of the 26 GHz band, rather than attempting other untested, experimental approaches to licensing.³¹ The Part 30 framework has been adopted in other millimeter wave bands, including the adjacent 24 GHz and 28 GHz bands, and adopting the same approach for the 26 GHz band would provide a nearly contiguous four gigahertz block

²⁷ *Spectrum Frontiers Third FNPRM* ¶ 76.

²⁸ See, e.g., World Radiocommunication Conference 2019 (WRC-19), Agenda and Relevant Resolutions, Agenda Items 1.5, 1.13 (revised Aug. 15, 2017), https://www.itu.int/dms_pub/itu-r/oth/14/02/R14020000010001PDFE.pdf (Agenda Item 1.13 examines the 24.25-27.5 GHz band, while Agenda Item 1.5 focuses on the 27.5-29.5 GHz band).

²⁹ See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, ¶¶ 22-27 (2016) (“*Spectrum Frontiers Report and Order*” or “*Spectrum Frontiers FNPRM*”); *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services et al.*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988, ¶ 22 (2017) (“*Spectrum Frontiers Second Report and Order*”).

³⁰ *Spectrum Frontiers Third FNPRM* ¶¶ 89, 91.

³¹ *Id.* ¶ 89.

of spectrum with consistent licensing rules for 5G. Additionally, as noted above, rapid equipment scale is possible given that the 26 GHz band has been a primary focus for other countries for 5G use and is likely to be globally harmonized.³²

Because of these facts, CTIA supports the Commission's suggestion that it prohibit use of the 26 GHz band for High Altitude Platform Systems ("HAPS") like the stratospheric platform stations ("STRAPS") proposed by Elefante.³³ Indeed, Elefante's proposal was roundly rejected by a number of parties, with additional commenters urging the Commission to conduct further study before even considering Elefante's request. For example, the National Radio Astronomy Observatory urged the Commission to reject Elefante's request due to "the profound implications for radio astronomy operations of allowing HAPS operations within line of sight of radio telescopes."³⁴ Moreover, T-Mobile observed that "[m]obile broadband technologies may also deploy in the 26 GHz band sooner than the Elefante Group's proposed stratospheric platforms, thereby bringing broadband to more people faster."³⁵ And Audacy highlighted that, if the Commission moves forward with Elefante's "highly speculative" proposal, it must explain how interference to Audacy's non-geostationary network will be addressed.³⁶ Given that Elefante

³² See e.g., G. Lerude, *GSA Tallies Worldwide 5G Spectrum*, MICROWAVE JOURNAL (Jan. 23, 2018), <http://www.microwavejournal.com/blogs/17-gary-lerude-mwj-technical-editor/post/29671-gsa-tallies-worldwide-5g-spectrum>; see also S. Kinney, *Global 5G spectrum allocations tracked in new GSA report*, RCRWireless News (Aug. 13, 2018), <https://www.rcrwireless.com/20180813/5g/5g-spectrum-gsa-report>.

³³ *Spectrum Frontiers Third FNPRM* ¶ 87. See also Elefante Group, Inc., Petition for Rulemaking, RM-11809 (filed May 31, 2018) ("Elefante Petition").

³⁴ Opposition and Comments of the National Radio Astronomy Observatory, RM-11809, at 4 (filed June 25, 2016).

³⁵ Opposition of T-Mobile USA, Inc., RM-11809, at 5 (filed July 11, 2018).

³⁶ Comments of Audacy Corporation, RM-11809, at 8-10 (filed July 11, 2018).

itself argued that it cannot share at all with terrestrial services,³⁷ the 26 GHz band should not be undermined by the proposed Elefante system but instead should be repurposed for terrestrial fixed and mobile services, such as 5G.³⁸

Further, to protect Space Research Service (“SRS”) and Earth Exploration Satellite Service (“EESS”) operations by Federal entities in the 26 GHz band, CTIA notes that the U.S. study submitted to the International Telecommunication Union (“ITU”) and referenced in the *Spectrum Frontiers Third FNPRM*³⁹ was based only on two specific sites and acknowledged that “received interference is highly dependent upon the local terrain, and the required separation distance to protect one earth station may not be the same as what is need to protect another.”⁴⁰ Additionally, while the study suggested that separation distances of 52 kilometers for SRS stations and seven kilometers for EESS stations would ensure the earth station operations are protected, the study also made clear that “the values may be different on a case-by-case basis for earth stations (e.g. use of terrain specific clutter, etc.).”⁴¹ Studies submitted by other administrations to the ITU found that much smaller separation distances could sufficiently protect EESS and SRS stations in the band.⁴² Based on the above, CTIA urges the Commission

³⁷ Elefante Petition at n.98 (“Elefante Group and Lockheed Martin have done an initial assessment of the prospects for sharing between SBCS and mobile operations and believe that IMT cannot share the spectrum without causing unacceptable interference or imposing unreasonable constraints on SBCS operations and, quite possibly, on Federal incumbent band users.”).

³⁸ See Opposition of CTIA, RM-11809, at 3-4 (filed July 11, 2018). As CTIA noted in its opposition, Elefante is seeking use of the 23 GHz and 70/80 GHz bands for its system that are critical for fixed microwave services and must be protected. See *id.* at 4-5.

³⁹ *Spectrum Frontiers Third FNPRM* ¶ 81.

⁴⁰ Sharing and Compatibility of ISS and IMT Operating in the 24.25-27.5 GHz Frequency Range, Attachment 4 to Annex 3 to Task Group 5/1 Chairman’s Report, ITU-R Document 5-1/406-E (May 21, 2018).

⁴¹ *Id.*

⁴² *Id.*

to adopt rules that call for separation distances to protect specific sites on a case-by-case basis using actual UMFUS deployment scenarios, rather than 52 kilometers for all SRS stations and seven kilometers for all EESS stations.

B. The Commission Should Adopt License Service Rules for the 42 GHz Band.

CTIA reiterates its support for adopting license service rules for the 42 GHz band. The 42 GHz band was proposed by the Commission for exclusive, licensed use more than two years ago,⁴³ and there is a robust record supporting adoption of terrestrial fixed and mobile service rules for this band.⁴⁴ Moreover, as the Commission tentatively concludes, the 42 GHz band should utilize the Part 30 UMFUS rules, given that it could be paired with the 37/39 GHz bands and has 500 megahertz of contiguous spectrum.⁴⁵ Globally, the 37-43.5 GHz band is being targeted for terrestrial fixed and mobile services.⁴⁶ Thus, allocating the 42 GHz band and adopting license service rules would provide additional access to spectrum in the U.S. that is harmonized with the rest of the world.

Moreover, equipment can be designed to have a tuning range that covers the entire 37-43.5 GHz band, making the 500-megahertz block at 42-42.5 GHz a desirable spectrum band for

⁴³ See *Spectrum Frontiers FNPRM* ¶¶ 403-07.

⁴⁴ See, e.g., Comments of AT&T, GN Docket No. 14-177, *et al.*, at 13 (filed Sept. 30, 2016); Comments of Samsung Electronics America, Inc., and Samsung Research America, GN Docket No. 14-177, *et al.*, at 6 (filed Sept. 30, 2016); Comments of T-Mobile USA, Inc., GN Docket No. 14-177, *et al.*, at 7 (filed Sept. 30, 2016); Comments of Verizon, GN Docket No. 14-177, *et al.*, at 3 (filed Sept. 30, 2016); Reply Comments of Qualcomm, Inc., GN Docket No. 14-177, *et al.*, at 4 (filed Oct. 31, 2016); Reply Comments of United States Cellular Corporation, GN Docket No. 14-177, *et al.*, at 5 (filed Oct. 31, 2016).

⁴⁵ *Spectrum Frontiers Third FNPRM* ¶ 52.

⁴⁶ See, e.g., World Radiocommunication Conference 2019 (WRC-19), Agenda and Relevant Resolutions, Agenda Item 1.13 (revised Aug. 15, 2017), https://www.itu.int/dms_pub/itu-r/oth/14/02/R14020000010001PDFE.pdf.

5G.⁴⁷ CTIA further supports both the PEA geographic license area and 100-megahertz spectrum block sizes suggested by the Commission.⁴⁸ Utilizing PEAs would be consistent with the Commission’s approach in other millimeter wave spectrum bands (*e.g.*, 37 GHz, 39 GHz, 47 GHz),⁴⁹ and 100 megahertz block sizes would facilitate the deployment of 5G services.

Although CTIA has long supported a mix of licensed and unlicensed spectrum, and appreciates the Commission seeking comment per the provisions in RAY BAUM’S Act on whether the 42 GHz band could be made available on an unlicensed basis,⁵⁰ the Commission should make this band available for licensed use. As the Commission notes, many commenters have already expressed support for Part 30 licensing rules,⁵¹ and allowing unlicensed operations in this band could potentially undermine the operation of new and innovative licensed services, including 5G, in this band. Moreover, there are already ample opportunities for unlicensed use cases in the millimeter wave bands, as the Commission has already provided 14 gigahertz of spectrum at 57-71 GHz for unlicensed uses above 24 GHz.

Finally, with regard to protecting Radio Astronomy Service (“RAS”) services in the 42 GHz band,⁵² CTIA again notes that the study T-Mobile conducted to examine RAS sharing in

⁴⁷ See *International Bureau Seeks Comment on Recommendations Approved by World Radiocommunication Conference Advisory Committee*, Public Notice, DA 18-423, Attach A at 14-15 (rel. Apr. 26, 2018).

⁴⁸ *Spectrum Frontiers FNPRM* ¶¶ 403, 406; *Spectrum Frontiers Third FNPRM* ¶ 57.

⁴⁹ *Spectrum Frontiers Report and Order* ¶¶ 82, 121; *Spectrum Frontiers Second Report and Order* ¶ 50.

⁵⁰ *Spectrum Frontiers Third FNPRM* ¶ 48.

⁵¹ *Id.*

⁵² *Id.* ¶¶ 55-56.

the 32/47/50 GHz bands would apply to protection zone calculations for RAS sites operating adjacent to the 42 GHz band.⁵³

C. The Commission Should Adopt a Simple, Straightforward Licensing Framework for the Lower 37 GHz Band.

CTIA supports the Commission's goal of ensuring that Federal and non-Federal users in the Lower 37 GHz band can successfully co-exist. That said, the licensing and sharing mechanism proposed in the *Spectrum Frontiers Third FNPRM* could be streamlined. Rather than instituting three different licensing schemes for point-to-point licenses, base station licenses, and site cluster licenses,⁵⁴ CTIA proposes that the Commission adopt a more straightforward approach to licensing in the Lower 37 GHz band. Proposals seeking more complex and/or dynamic sharing are unjustifiable for this band, and there is no reason to believe that a dynamic framework would be necessary or suitable in the future.

Moreover, CTIA urges the Commission to clarify how it would handle applications filed simultaneously that would be mutually exclusive. The Commission appears to expect that parties will self-coordinate prior to applying to avoid mutual exclusivity,⁵⁵ but does not explicitly state whether this is the case.

Finally, CTIA asks the Commission to clarify the rights provided to license holders in the Lower 37 GHz band. Although the *Spectrum Frontiers Third FNPRM* appears to indicate that

⁵³ Letter from Steve B. Sharkey, Vice President, Government Affairs – Technology and Engineering Policy, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed Oct. 2, 2017) (“T-Mobile Coexistence Study”).

⁵⁴ *Spectrum Frontiers Third FNPRM* ¶¶ 70-73.

⁵⁵ *Id.* ¶ 65.

licensees would have interference protection, it also states that parties have “no right to exclude other users.”⁵⁶ The Commission should make clear the specific rights granted to license holders.

D. The Commission Should Not Adopt Licensing Rules for FSS Earth Stations in the 50.4-51.4 GHz Band Until It Finalizes Action on Service Rules for UMFUS in this Band.

The Commission proposes to adopt rules permitting licensing of individual FSS earth stations in the 50.4-51.4 GHz band using the sharing criteria adopted for the 24.75-25.25 GHz band.⁵⁷ In conjunction with this proposal, the Commission suggests limiting the number of earth stations per county and per PEA.⁵⁸ CTIA believes the Commission should first adopt service rules for UMFUS for this band, which it sought comment on several years ago,⁵⁹ before taking final action for licensing individual FSS earth stations.

IV. SHARING BETWEEN COMMERCIAL AND GOVERNMENT USERS IN THE MILLIMETER WAVE BANDS SHOULD BE GOVERNED BY A DEFINED SET OF PRINCIPLES.

Throughout the *Spectrum Frontiers Third FNPRM*, the Commission seeks comment on how to address sharing between Federal and non-Federal users in various spectrum bands.⁶⁰ CTIA is cognizant of the need to protect Federal incumbents and allowing government agencies the ability to expand their spectrum use over time. However, given the national priority for 5G services and systems and the need for certainty for licensees to invest in those systems, some guiding principles should be established to enable both parties to move forward with their spectrum usage in a mutually beneficial manner.

⁵⁶ *Id.*

⁵⁷ *Id.* ¶ 94.

⁵⁸ *Id.*

⁵⁹ See *Spectrum Frontiers FNPRM* ¶¶ 420-423 (proposing to authorize fixed and mobile operations in the 50 GHz band under Part 30 UMFUS rules).

⁶⁰ See, e.g., *Spectrum Frontiers Third FNPRM* ¶¶ 53, 62, 64-66, 68, 74, 82-84.

CTIA suggests that the Commission address sharing between Federal fixed and mobile users and commercial entities delivering 5G services by developing a set of guiding principles that could be implemented across all millimeter wave bands, such as:

1. All sharing criteria should be equitable—each sharing scenario should be governed by the same engineering assumptions and requirements;
2. Commercial fixed and mobile services (such as 5G) should have primary use of spectrum in metropolitan and urban areas, as sharing between government and commercial users may be possible in remote, non-populated areas, but would be more difficult—if not impossible—in metropolitan and urban locations; and
3. Aeronautical mobile use of spectrum in shared bands should not be permitted, as the use of any type of airborne system or operation by Federal users, regardless of whether in a rural or remote area or in a metropolitan area, would preclude sharing between commercial terrestrial and government uses.

CTIA also observes that Federal users have focused on obtaining a primary allocation in the millimeter wave bands because they are unable to undertake procurement for services in bands where they have only a secondary allocation. CTIA believes that the Commission should not determine primary and secondary allocations based solely on Federal procurement rules. Instead, CTIA encourages Federal users to work with NTIA to update the Federal procurement rules to more readily enable deployment, even with a secondary allocation.

Finally, CTIA urges the Commission to refrain from allowing Federal entities to add new coordination zones to the 37.6-38.6 GHz band once applications for an auction of any portion of that band have been accepted.⁶¹ Once an auction application is filed, the goalposts should not be moved. Permitting the addition of coordination zones after auction applications are filed would severely disadvantage winning bidders, as the valuation of the specific spectrum rights on which they bid may be negatively affected by the addition of sites post-auction.

⁶¹ *Id.* ¶ 74.

Federal licensees can expand their use of the spectrum so long as the underlying spectrum rights associated with exclusive use licenses issued by auction are not modified. For example, FSS applicants and licensees are able to add new earth station locations and operations so long as they maintain the protection of terrestrial Part 30 fixed and mobile licensees.⁶² Similar criteria could be established to permit enhanced Federal use. Moreover, Federal entities may undertake private negotiations with individual auction licensees to allow increased use, or changes to use, that is fully coordinated. Finally, the 37-37.6 GHz band was established to allow for greater Federal flexibility of spectrum use, and the Commission, in consultation with NTIA, should work to facilitate sharing in this lower portion of the band.

In sum, wireless licensees require certainty as to the rights associated with their licenses, particularly those provided via auction, and the Commission's proposal to allow unfettered changes to Federal operations in the 37.6-38.6 GHz band would undermine these rights without any indication of how and when Federal users may seek additional protection. Wireless entities must expend significant money to plan and deploy their systems—under the Commission's proposal those investments could be nullified without any advanced warning. Therefore, it is vitally important that the Commission maintain the existing licensing framework that protects Federal incumbent uses while providing wireless licensees rights that are clear-cut and certain.

⁶² 47 C.F.R. § 25.136.

V. CONCLUSION.

CTIA supports the Commission's efforts in the *Spectrum Frontiers* proceeding to facilitate the nation's 5G future by allocating additional spectrum for terrestrial mobile and fixed services. Next-generation 5G wireless services will unlock enormous benefits to the public and to the U.S. economy, and many of the Commission's proposals in the *Spectrum Frontiers Third FNPRM* will help ensure that wireless providers have access to the necessary spectrum resources to realize these benefits. CTIA applauds the Commission for its continued diligence and looks forward to working with the Commission on executing on the Commission's 5G agenda and investing the billions of dollars needed to deliver next-generation services to Americans.

Respectfully Submitted,

/s/ Kara R. Graves

Kara R. Graves
Director, Regulatory Affairs

Thomas C. Power
Senior Vice President and General Counsel

Scott K. Bergmann
Vice President, Regulatory Affairs

Paul Anuszkiewicz
Vice President, Spectrum Planning

Jennifer L. Oberhausen
Director, Regulatory Affairs

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

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