

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 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 THE
CONSUMER TECHNOLOGY ASSOCIATION F/K/A/
THE CONSUMER ELECTRONICS ASSOCIATION**

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EXECUTIVE SUMMARY

As mobile broadband use – and its benefits to consumers and the U.S. economy – continue to grow, CTA’s members continue to pursue exciting research and test innovative deployments of Fifth Generation (“5G”) service. In light of consumers’ insatiable demand for increasingly data-intensive applications, CTA commends the Commission’s many efforts to facilitate more efficient use of underutilized spectrum. The Commission should continue to pursue an “all of the above” strategy to making more spectrum available for mobile and other innovative uses, and this *Notice of Proposed Rulemaking* is an important new step towards alleviating the spectrum crunch and enabling 5G technologies.

Although the new, lower band mobile spectrum now starting to enter the pipeline will be critical to continuing to provide sufficiently fast and ubiquitous mobile services, 5G also requires additional spectrum bands. The millimeter bands hold great promise for meeting demand not only for mobile services, but also for a wide range of other service needs, including backhaul, other point-to-point applications, unlicensed wireless cable replacement, satellite and aerial broadband, and other services. The Commission appropriately based its evaluation of bands suitable for new services around criteria generally consistent with the principles CTA proposed in its initial comments. The principles urge the Commission to move at a pace commiserate with industry and the international community to allow new and existing services to flourish within the millimeter wave bands.

With the guiding principles in mind, CTA urges the Commission to move swiftly to expand unlicensed operations throughout the entire 57-71 GHz band by adopting new rules to allow unlicensed operations in the 64-71 GHz band under Part 15. Similarly, the Commission should adopt, with certain modifications, rules to establish a new Upper Microwave Flexible Use Service in the 28 GHz, 39 GHz, and 37 GHz bands. CTA proposes rules to create licenses that will attract investment to expand current services and deploy new ones. By ensuring that the new licenses are sufficiently flexible, innovators will be able to deploy emerging and currently unknown technologies in the future.

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I. INTRODUCTION

The Consumer Technology Association (“CTA”)¹ respectfully submits these comments in response to the above-captioned *Notice of Proposed Rulemaking* (“Notice”), which proposes

¹ The Consumer Technology Association (“CTA”)TM, formerly the Consumer Electronics Association (“CEA”)[®], is the trade association representing the \$285 billion U.S. consumer technology industry. More than 2,200 companies – 80 percent are small businesses and startups;

new rules to enable mobile and unlicensed services in four bands above 24 GHz.² Mobile broadband use continues to grow at an exponential rate and will continue to expand dramatically for the foreseeable future.³ To meet that demand, industry has invested billions of dollars to extract additional capacity from the spectrum that is presently available for mobile broadband. In a cat-and-mouse game of ever improving services for consumers, each new generation of mobile broadband allows for better speeds, which, in turn, foster the adoption and usage of high-bandwidth applications.⁴ For this reason, CTA eagerly anticipates the upcoming, first-ever Incentive Auction, which will introduce more licensed and unlicensed spectrum for mobile broadband services.

CTA also applauds the Commission’s many positive steps to facilitate innovative use of previously underutilized spectrum for mobile broadband and other wireless services.⁵ The

others are among the world’s best known brands – enjoy the benefits of CTA membership including policy advocacy, market research, technical education, industry promotion, standards development, and the fostering of business and strategic relationships. CTA also owns and produces CES[®] – the world’s gathering place for all who thrive on the business of consumer technology. Profits from CES are reinvested into CTA’s industry services.

² *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878 (2015) (“*Notice*”).

³ *See, e.g.*, Comments of the Consumers Electronics Association, ET Docket No. 15-105, at 4 (June 11, 2015) (“CTA LTE-U Comments”); Comments of the Consumer Electronics Association, GN Docket No. 14-177, at 3-5 (Jan. 15, 2015) (“CTA NOI Comments”). For clarity, we use the name “CTA,” even when previously filed comments were under the name CEA.

⁴ *See* Gary Arlen, *Game of Gigs*, CTA i3, at 17 (Nov./Dec. 2015) (noting that consumers will not be “satisfied to leave their high-speed wired homes and go back to 3 Mbps wireless access,” but “wired and wireless will both get faster”), <http://mydigimag.rrd.com/publication/?i=280050>; Cisco, Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2014–2019, at 4 (Feb. 3, 2015) (“In 2014, a fourth-generation (“4G”) connection generated 10 times more traffic on average than a non-4G connection”) (“Cisco VNI”), http://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/white_paper_c11-520862.pdf.

⁵ *See generally* Comments of the Consumer Electronics Association, ET Docket No. 15-26 (Apr. 20, 2015) (supporting the expansion of vehicular radar in the 76-81 GHz band); Comments of the

Commission should not stop – or even slow down – at this juncture. The wireless and consumer electronics industries have turned their attention to the development of standards for Fifth Generation (“5G”) wireless services to meet consumer demand, and the provision of 5G-level service will require use of additional frequency bands (particularly in those places where traffic demands will be highest), in addition to the new, lower band mobile spectrum now starting to enter the pipeline.

In the *Notice*, the Commission takes the next step in identifying and accommodating potential new uses for the millimeter wave (“mmW”) bands above 24 GHz, including for the provision of 5G wireless services and for other evolving and innovative uses. With this goal in mind, CTA appreciates that the *Notice* reflects many of the key values CTA outlined in its initial comments in response to the Spectrum Frontiers Notice of Inquiry (“*NOI*”).⁶ The success of the Commission’s flexible use policy demonstrates that market forces are the most appropriate mechanism for determining what technologies will best serve consumer demand. Therefore, the Commission should adopt its proposal, with certain modifications, to allow unlicensed operations in the 64-71 GHz band and create a new Upper Microwave Flexible Use Service in the 28 GHz, 39 GHz, and 37 GHz bands.

Consumer Electronics Association, ET Docket No. 12-354 (Feb. 20, 2013) (encouraging the Commission to explore the possibility of spectrum sharing in the 3.5 GHz band between Federal and non-Federal users); Comments of the Consumer Electronics Association, GN Docket No. 12-268 (Jan. 25, 2013) (“CTA Incentive Auction Comments”) (discussing four key principles to ensure the success of Incentive Auction); Comments of the Consumer Electronics Association, ET Docket Nos. 04-186 and 02-380 (Jan. 31, 2007) (supporting the use of fixed low-powered devices on an unlicensed basis in TV “white spaces”).

⁶ *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Notice of Inquiry, 29 FCC Rcd 13020 (2014) (“*NOI*”).

II. THE MMW BANDS CONTINUE TO SHOW PROMISE FOR MEETING THE GROWING DEMAND FOR MOBILE SERVICES

The Commission should continue its laudable efforts to increase the amount of spectrum available for mobile broadband. The next generation of mobile service will involve multiple spectrum bands, with the network employing the most appropriate frequencies for the best delivery of a particular service.⁷ The mmW bands hold promise for meeting demand in heavily congested areas and can be one tool (of many) to alleviate the spectrum crunch.⁸ Beyond providing supplemental capacity for wide-area mobile networks, these bands may also be useful for innovative and emerging applications, including backhaul, other point-to-point applications, unlicensed wireless cable replacement, satellite and aerial broadband, and other services.⁹ The Commission's rules should ensure sufficient spectrum is available for all of these uses.

CTA's members continue to make exciting progress towards the development and commercialization of mmW and 5G technologies. As noted by the Commission, "[s]ince the release of the Commission's *NOI* ... there has been increased momentum behind the development of 5G technologies."¹⁰ As a baseline, 5G systems will provide gigabit-rate data services regardless of user mobility and/or location, which is significantly higher than most systems today and will enable the increasingly data-intensive world resulting from the

⁷ See Murray Slovic, *5G: The Mobile Tech of 2020*, CEA i3, at 25 (Nov./Dec. 2014), <http://cdn.coverstand.com/25838/232265/711ba5485b2b1c66036f89c895b2-baecbaa98e91.23.pdf>.

⁸ *Id.*

⁹ CTA NOI Comments at 3; FCC Technological Advisory Committee ("TAC"), Summary of Meeting at 8, Spectrum Frontier Working Group Presentation at Slide 5 (Sept. 23, 2013) ("TAC September Summary") (reviewing several ongoing projects in the 28-40 GHz bands), <http://transition.fcc.gov/bureaus/oet/tac/-tacdocs/meeting92313/TACMeetingSummary9-23-13.pdf>.

¹⁰ *Notice*, 30 FCC Rcd at 11884-85 ¶ 12.

combination of high definition video and billions of devices in the Internet of Things.¹¹ For example, Samsung has already completed a 5G network test in the 28 GHz band that achieved network data transmission rates of 7.5 Gbps,¹² and Intel is decluttering the modern office by replacing cords and other device-to-device connections with technology that utilizes the 60 GHz band, WiGig.¹³

III. THE PROPOSED RULES ARE GENERALLY CONSISTENT WITH THE GUIDING PRINCIPLES SET FORTH BY CTA IN RESPONSE TO THE *NOTICE OF INQUIRY*

The Commission appropriately crafted its proposed rules to evaluate the suitability of mmW bands around the majority of the six guiding principles CTA set forth in its *NOI* comments.¹⁴ By adhering to these “touchstones of rules and policies to encourage investment and innovation” when developing its service rules, the Commission can best facilitate innovation in the mmW bands.¹⁵ Specifically:

*Sufficient spectrum to be meaningful, i.e., at least 500 MHz.*¹⁶ As CTA explained, the Commission must continue to be an active facilitator in the development of technologies utilizing the mmW bands, including working at a pace commensurate with industry

¹¹ See Cisco VNI at 3 (“Global mobile data traffic will increase nearly tenfold between 2014 and 2019.”).

¹² Press Release, Samsung, *Samsung Electronics Sets 5G Speed Record at 7.5Gbps, Over 30 Times Faster than 4G LTE*, (Oct. 15, 2014), <http://www.samsung.com/uk/news/local/samsung-electronics-sets-5g-speed-record-at-7-5gbps-over-30-times-faster-than-4g-lte>.

¹³ Intel, *Frequently Asked Questions About WiGig for Network and I O*, Article ID: 000007805 (last updated Dec. 21, 2015) (WiGig “uses the 60-GHz band to deliver instant, seamless, high speed (up to 7 Gbps) wireless docking ... replac[ing] cables for many devices including HD monitors, USB storage, and keyboards”), <http://www.intel.com/content/www/us/en/support/-network-and-i-o/wireless-networking/000-007805.html?wapkw=wigig> (last visited Jan. 23, 2016).

¹⁴ CTA NOI Comments at 8.

¹⁵ *Id.*

¹⁶ *Notice*, 30 FCC Rcd at 11887 ¶ 20.

developments.¹⁷ Important research is being done with both larger and smaller swaths of spectrum. Through the Technological Advisory Committee (“TAC”), workshops, and the other vehicles available to the Commission, the agency will best be able to keep abreast of developments so as to act promptly and appropriately when opportunities to facilitate new and innovative uses arise.¹⁸ This will ensure the Commission is able to free up sufficient spectrum to be meaningful.

*Bands being considered internationally for mmW mobile service.*¹⁹ The Commission should continue to encourage and participate in global harmonization, including offering the Commission’s experience with spectrum sharing, and promoting intelligent allocation for multiple uses without losing sight of incumbents.²⁰ International harmonization allows CTA members and others to leverage the numerous 5G initiatives both here and abroad, reducing costs and increasing the speed to market for these new technologies. Focusing on bands being considered internationally for mmW mobile service thus conserves resources, expedites speed to market for deployment, and otherwise is a sensible and important consideration.

¹⁷ CTA NOI Comments at 11.

¹⁸ See, e.g., TAC September Summary at 12; Spectrum Frontier Working Group Presentation at Slide 9 (recommending the Commission hold a workshop with industry experts to discuss “Enabling Technologies for Mobile Broadband” and “Potential Global Harmonization and Economies of Scale” with respect to the 30 GHz – 40 GHz bands); FCC TAC, Summary of Meeting at 70, Spectrum Frontier Working Group Presentation at Slide 15 (Dec. 9, 2013) (“TAC December Summary”) (with respect to the 95 GHz – 275 GHz bands, recommending that the Commission “[m]onitor progress,” host a workshop or technology day, and “[e]ngage in the international activities for this band”), <http://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting-12913/TACMeetingSummary12-9-13.pdf>.

¹⁹ Notice, 30 FCC Rcd at 11887 ¶ 21.

²⁰ CTA NOI Comments at 11.

*Bands that can accommodate a wide range of interests in the mmW bands, including incumbents.*²¹ Any new spectrum allocations and service rules should be crafted to minimize interference while maximizing utility, and should be designed to work synergistically with complementary or equivalent services in lower bands.²² The new rules should accommodate the entire range of possible uses for the mmW bands, providing a variety of licensed, unlicensed, and hybrid approaches. Over the last few years, the Commission has correctly proposed and employed a range of unlicensed,²³ exclusive licenses,²⁴ licensed-by-rule,²⁵ and sharing approaches²⁶ to enable new uses of spectrum, and the Commission should consider whether these approaches would be appropriate to facilitate efficient use of spectrum above 24 GHz.

*Rules that will allow a variety of uses.*²⁷ 5G mobile broadband is critical to the next generation of innovation, but it also is important to accommodate the wide range of other uses for which the mmW bands are appropriate.²⁸ Indeed, many of the mmW bands are already allocated, in use or being explored for uses other than mobile broadband service. Further, technical neutrality and upholding the Commission's commitment to not define, standardize, or

²¹ *Notice*, 30 FCC Rcd at 11887-88 ¶ 22.

²² CTA NOI Comments at 14.

²³ *See, e.g., Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, First Report and Order, 29 FCC Rcd 4127 (2014).

²⁴ *See, e.g., Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd 6567 (2014).

²⁵ *See, e.g., Amendment of Parts 1, 2, 15, 90 and 95 of the Commission's Rules to Permit Radar Services in the 76-81 GHz Band*, Notice of Proposed Rulemaking and Reconsideration Order, 30 FCC Rcd 1625 (2015).

²⁶ *See, e.g., Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959 (2015).

²⁷ *Notice*, 30 FCC Rcd at 11888 ¶ 23.

²⁸ CTA NOI Comments at 9.

specify the characteristics of mmW services are crucial.²⁹ Its technology neutral stance with respect to prior generations of mobile service has promoted technical innovation and a robust, competitive market. Finally, service rules and licensing regimes should reflect the best use of the mmW bands in light of the physical characteristics of the spectrum and the developing technology.³⁰ In particular, the mmW bands, where non-line-of-sight propagation is limited, may allow significant spectrum reuse. Even so, reliance on the marketplace and physics, rather than ungrounded regulatory requirements, will lead to the best uses of the available spectrum.

IV. THE COMMISSION SHOULD ADOPT ITS PROPOSAL TO ALLOW UNLICENSED OPERATIONS UNDER PART 15 IN THE 64-71 GHZ BAND

Moving quickly to allow additional unlicensed operations under Part 15 in the 64-71 GHz band will add important capacity to the existing 57-64 GHz band, which is already allocated for unlicensed operations.³¹ As CTA consistently has demonstrated in various Commission proceedings, unlicensed spectrum is a hotbed for innovation and integral in addressing the spectrum crunch.³² Therefore, the Commission should adopt its proposal to modify and then apply the technical requirements in section 15.255 to the entire 57-71 GHz band (*i.e.*, the existing 57-64 GHz and the proposed 64-71 GHz band).³³ For example, CTA enthusiastically endorses the proposal to allow operations on board aircraft so that consumers can use their Wi-Fi

²⁹ *Id.* at 10.

³⁰ *Id.* at 13.

³¹ *See Notice*, 30 FCC Rcd at 11899 ¶ 59.

³² *See, e.g.*, CTA LTE-U Comments at 2; CTA Incentive Auction Comments at 26.

³³ *Notice*, 30 FCC Rcd at 11965 ¶ 303 (“we believe that the existing technical rules in the 57-64 GHz band can successfully apply to the proposed 64-71 GHz adjacent band, with certain minor adjustments”).

and future WiGig products while in flight.³⁴ In addition to enforcement concerns related to prohibiting one flavor of Wi-Fi aboard airplanes, forcing consumers “to affirmatively disable Wi-Fi operation at 60 GHz (but not in the 2.4 GHz or 5 GHz frequency ranges)” would cause needless confusion without reducing interference or generating another offsetting benefit.³⁵

At the same time, the Commission should eliminate restrictions on field disturbance sensors across the 57-71 GHz band.³⁶ Applications using these sensors are powering new innovations in wireless technology – including gesture technology that allows users to interact with devices without needing to touch them.³⁷ Equally importantly, the concerns regarding interference that prompted the Commission to ban mobile fixed disturbance sensors no longer apply today: unlike the radars discussed in the Commission’s 1995 order considering this issue,³⁸ today’s field disturbance sensors can operate at much lower power levels and have smaller fields of influence, greatly lessening their potential for interference.³⁹

V. AN UPPER MICROWAVE FLEXIBLE USE SERVICE WILL BEST ENABLE THE MOST PRODUCTIVE USE AND RESOLVE ANY TECHNICAL ISSUES ASSOCIATED WITH THE NEW BANDS

The Commission’s proposals to (i) create a new service for the 28 GHz, 39 GHz, and 37 GHz bands – the Upper Microwave Flexible Use Service – and (ii) establish rules that will allow

³⁴ *See id.* at 11966 ¶ 306 (“we believe that the prohibition on operation on board aircraft may be revisited at the present time”).

³⁵ *Id.* at 11966 ¶ 304.

³⁶ *See Id.* at 11967 ¶ 307 (seeking comment on “whether to extend the requirements for these fixed field disturbance sensors in Section 15.255 into the proposed 64-71 GHz band”).

³⁷ *See, e.g.*, Christoph Hammerschmidt, *Google Gesture Sensor Uses 60 GHz Radar*, EETIMES EUROPE (June 1, 2015) (“Hammerschmidt”), http://analog-eetimes.com/en/google-gesture-sensor-uses-60-ghz-radar.html?cmp_id=7&news_id=222907323&vID=44.

³⁸ *Amendment of Parts 2, 15 and 97 of the Commission’s Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications*, First Report and Order and Second Notice of Proposed Rule Making, 11 FCC Rcd. 4481, 4487-88 ¶ 13 (1995).

³⁹ Hammerschmidt.

an Upper Microwave Flexible Use Service licensee to provide any form of fixed or mobile service are positive steps towards increasing the efficiency of the spectrum above 24 GHz. Some of the details, however, merit adjustments to increase utility and decrease transaction costs. Specifically, exclusive licenses based on the current sizes in the 28 GHz and 39 GHz bands and technology neutral rules will best encourage innovation and investment.

A. *GOOD LICENSE DESIGN IS CRUCIAL TO MAKING THE NEW SERVICE A SUCCESS*

Geographic Area Licensing. Granting new licenses that provide new flexible rights to operate in a licensed geographic area and include the same spectrum, with authorization for both fixed and mobile operations, to current 28 GHz and 39 GHz licensees will enable the fastest transition to expanded use of the band.⁴⁰ Similarly, competitive bidding is a common sense, time-tested method that the Commission should utilize to assign new Upper Microwave Flexible Use Service licenses for geographic license areas with no existing LMDS or 39 GHz licensees.⁴¹ The Commission correctly observes that “[i]ssuing a single license including both fixed and mobile service rights would allow the licensee to coordinate fixed and mobile uses within its geographic area” and is consistent with the Commission’s approach to other flexible use bands.⁴²

As both the Commission and industry have extensive experience with geographic area licensing, which Commission plans for the 39 GHz band, the Commission should abandon its proposals to introduce one of three, new “hybrid” schemes into the 37 GHz bands.⁴³ Though a

⁴⁰ *See Notice*, 30 FCC Rcd at 11907-08 ¶ 93.

⁴¹ *Id.* at 11907 ¶ 93.

⁴² *Id.* at 11908 ¶ 94.

⁴³ *See id.* at 11909 ¶ 100, 11911 ¶ 105-106.

well-intentioned attempt to maximize flexibility,⁴⁴ the hybrid alternatives would unnecessarily partition the band and create a significant different band plan and use when compared to the adjacent 39 GHz band. Instead, the Commission should return to first principles and consider what avenue would bring the most flexible, innovative, and technically feasible use to the 37 GHz band.

License Area Size for the 28 GHz, 39 GHz, and 37 GHz Bands. The base geographic area unit for the new Upper Microwave Flexible Use Service licenses should be either economic areas (“EAs”) or basic trading areas (“BTAs”). Although CTA appreciates that the Commission proposed a county-by-county licensing scheme to reflect the “characteristics of millimeter wave spectrum,” such a regime would be inefficient.⁴⁵ The new Upper Microwave Flexible Use Service builds on the decades-old existing licensing regime in the 28 GHz and 39 GHz.⁴⁶ Rather than break apart the licenses by counties and impose potentially high transaction costs on companies for reconstituting the once larger licenses, preserving the current geographic blocks would efficiently divide and encourage swift deployment of new services in these bands. Similarly, if the Commission determines to abandon its hybrid approach for the 37 GHz band in favor of issuing licenses, it should apply the same base geographic units to the 37 GHz band as in the 39 GHz band. The EAs and BTAs would provide “maximum flexibility” within a

⁴⁴ See *id.* at 11909 ¶ 100 (“Unlike in the 28 GHz and 39 GHz bands, there are no incumbent non-Federal terrestrial authorizations in the 37 GHz band. This lack of incumbents gives us additional flexibility in designing a licensing mechanism for this band.”).

⁴⁵ See *id.* at 11912 ¶ 109 (citing CTA’s comments urging the Commission to take into account the physical characters of the mmW bands when designing the “geographic scope of licenses”); *id.* at 11912 ¶ 110 (proposing to use counties as the base geographic area unit for licenses in the 28 GHz, 39 GHz, and 37 GHz bands).

⁴⁶ See *NOI*, 29 FCC Rcd at 13035-37 ¶¶ 51, 56 (explaining that 28 GHz band is currently licensed by BTA and the 39 GHz is currently licensed by EA).

sufficiently large geographic area to deploy base stations in response to demand.⁴⁷ A county-by-county regime risks imposing significant transaction costs starting with an auction that may produce contiguous licenses too small to encourage build-out, then increased frequency coordination agreements stemming from the potential increase in neighboring license areas, and finally a potentially expensive pursuit of a license on the secondary market every time a company is ready to expand over the county line.

Band Plan for the 28 GHz, 39 GHz, and 37 GHz Bands. The band plan should foster a central goal of deploying new spectrum: to improve existing mobile broadband networks and to support the deployment of new mobile broadband networks, while respecting existing uses. Thus, the Commission should favor band configurations that will best support current and emerging mobile broadband technologies. The Commission correctly observed that continuing to license the 28 GHz band “as a single block would be in the public interest because it would provide a wide band (850 megahertz) of continuous spectrum that could be used to provide high-speed service.”⁴⁸ In the same vein, the Commission should start with unpaired, wide blocks – at least 200 MHz – in the 37 GHz and 39 GHz bands to encourage deployments in these bands.⁴⁹ A mixture of licenses will provide the best opportunity to meet 5G targets (for example there could be three 800 MHz and one 600 MHz license block). Therefore, the Commission may wish to consider auctioning some 800 MHz blocks, akin to the 850 MHz licenses in the 28 GHz band.

⁴⁷ *See id.* at 13046 ¶ 92.

⁴⁸ *Notice*, 30 FCC Rcd at 11914 ¶ 116.

⁴⁹ As noted above, if the Commission determines to issue licenses in the 37 GHz band, the agency should use the same band plan as the 39 GHz band.

By shaping the licenses of the new Upper Microwave Flexible Use Service accordingly to the suggestions above, the Commission will maximize innovation for mobile and other services in the 28 GHz, 39 GHz, and 37 GHz bands.

B. ALLOWING FLEXIBLE USE WILL BEST ENABLE LICENSEES TO MOVE LICENSES TO THE MOST PRODUCTIVE USE AND RESOLVE ANY TECHNICAL ISSUES ASSOCIATED WITH THE NEW BANDS

Maximizing innovation and investment in the mmW demands a regulatory regime that is sufficiently flexible to accommodate a range of deployments, technologies, and licensees. The business judgments of individual applicants and licensees, rather than arbitrary regulatory restraints, should “shape the nature of the services” in the 28 GHz, 39 GHz, and 37 GHz bands.⁵⁰

Regulatory Status. Consistent with the principle of flexible use and permitting diverse uses in these bands, the Commission should adopt its proposal to permit applicants and licensees to request common carrier status, non-common carrier status, private internal communications status, or a combination of these options, for authorization in a single license or to switch between them.⁵¹ Currently LMDS and 39 GHz licensees have a measure of this flexibility,⁵² and new Upper Microwave Flexible Use Service licensees should also be able to elect the regulatory status that best reflects their intended offerings.

Eligibility. An open eligibility standard for Upper Microwave Flexible Use Service license would open the bands to any prospective licensee who meets the Commission’s basic licensee qualifications and encourage efforts to develop new technologies, products, and

⁵⁰ See Notice, 30 FCC Rcd at 11931 ¶ 182 (“[O]ur goal is to maintain an open and flexible approach that will allow the business judgments of individual applicants and licensees in these bands to shape the nature of the services offered pursuant to their licenses.”).

⁵¹ *Id.* at 11932 ¶ 183.

⁵² See *id.* at 11930-31 ¶¶ 179-181.

services, while helping to ensure efficient use of this spectrum.⁵³ As demonstrated by CTA’s membership, innovative companies are both established and startups, large and small; artificially restricting eligibility risks stifling new technologies, products, and services.

Performance Requirements. Build-out or other performance requirements should reflect the strengths and weaknesses of these spectrum bands. The Commission should continue to “tailor[] performance requirements with an eye to the unique characteristics of individual frequency bands and types of services expected.”⁵⁴ Because the “ample technical challenges” identified by the TAC remain,⁵⁵ performance requirements, if any, should reflect that the shorter waves in the mmW bands require a much greater density of base stations – density that would be present in urban areas – than mobile broadband at the lower spectrum bands. More importantly, a robust secondary marketplace will lead to the best uses of the available spectrum.

Secondary Markets. Secondary markets have the potential “to promote more efficient, innovative, and dynamic use of the spectrum, expand the scope of available wireless services and devices, enhance economic opportunities for accessing spectrum, and promote competition among providers.”⁵⁶ To achieve these important goals, the Commission should continue to permit partitioning and disaggregation by 28 GHz and 39 GHz licensees and allow 37 GHz licensees to do so under the new Upper Microwave Flexible Use Service regime.⁵⁷ Giving industry the freedom to determine the correct size of licenses through partitioning and leasing

⁵³ *Id.* at 11933 ¶ 189.

⁵⁴ *Id.* at 11935 ¶ 194.

⁵⁵ CTA NOI Comments at 13 (citing TAC December Summary at 60, Spectrum Frontier Working Group Presentation at Slide 5).

⁵⁶ *Notice*, 30 FCC Rcd at 11946 ¶ 238.

⁵⁷ *See id.* at 11944 ¶ 232 (proposing to continue permitting partitioning and disaggregation by 28 GHz and 39 GHz licensees and to allow 37 GHz licensees to partition or disaggregate their licenses).

will enable the Commission to start from the current (and easier-to-auction) EA and BTA license areas while allowing the marketplace to size the licenses for the most productive deployments.⁵⁸

Similarly, the Commission should allow the current spectrum leasing policies and rules (in current Part 101) to apply to the new Part 30 radio service.⁵⁹

Security. Network security is highly dynamic and function-specific, and the Commission should not risk creating vulnerabilities by enshrining certain specific protocols in security rules. The Commission has an important role to play in facilitating secure networks and protecting consumers against security threats. Therefore, CTA commends the Commission for seeking comment “on how to ensure that effective security features are built into key design principles for all mmW band communications devices and services.”⁶⁰ However, as the Commission crafts new rules for the mmW, the agency must confirm that its actions will allow industry to adopt evolving security protocols and practices and respond proportionately to the security risk. Importantly, the Commission must refrain from adopting rules that trigger unintended consequences such as preventing companies from improving their products and services over time or deploying new ones.⁶¹

Technical Rules. CTA supports baseline technical rules such as RF safety issues and minimizing interference. The Commission should not require the use of any particular

⁵⁸ *See id.* (“[L]eav[ing] the decision of determining the correct size of licenses to the licensees and the marketplace ... is consistent with the flexible approach to licensing these bands that we have proposed in this NPRM.”); *see also supra* pages 11-12, urging the Commission to adopt EAs and BTAs as the base geographic units for its new Upper Microwave Flexible Use Service licenses.

⁵⁹ *Notice*, 30 FCC Rcd at 11946 ¶ 238.

⁶⁰ *Id.* at 11952 ¶ 260.

⁶¹ *See Reply Comments of the Consumer Electronics Association*, ET Docket No. 15-170, RM-11673, at 8 (Nov. 9, 2015) (warning that mandating software security protocols in the equipment authorization context “may lead to unintended consequences – namely making firmware updates more difficult and hampering manufacturers’ ability to repair software glitches in the field”).

technology on any block of spectrum but should instead stay true to its successful history of flexible use by allowing consumer needs to drive interoperability.⁶² Rather, the Commission's rules should adapt as technologies develop. For example, the Commission should consider adopting a higher mobile base station power than currently proposed 20 watts to bring.⁶³ By maintaining its technology neutral stance, the Commission will continue to promote technical innovation and a robust, competitive market.

Regarding New Rule Service and Part. CTA supports the proposal to regulate the new service under a new Part 30 of the Commission's rules.⁶⁴ Certain other rule parts generally applicable to wireless should apply to the new service.⁶⁵

Satellite Use of the 27.5 GHz-28.35 GHz and 37.5-40 GHz bands. Consistent with the guiding principle that Commission must accommodate a wide range of interests in the mmW bands, including incumbents, potential mobile broadband service providers, and other potential users of the mmW spectrum, CTA appreciates that the Commission posed several alternatives for accommodating satellite use in the 27.5-28.35 GHz and 37.5-40 GHz bands.⁶⁶ With respect to the 27.5-28.35 GHz, the Commission should adopt a market-based mechanism under which satellite earth stations may acquire co-primary status to avoid placing significant burdens on primary licensees and risk foreclosing potentially more productive uses.⁶⁷ As with the secondary market for licenses in the proposed Upper Microwave Flexible Use Service, the Commission

⁶² Notice, 30 FCC Rcd at 11964 ¶ 296.

⁶³ See *id.* at 11988, Appendix A, proposed Section 30.202(c).

⁶⁴ See *id.* at 11930 ¶ 117.

⁶⁵ See *id.* at 11947 ¶ 242.

⁶⁶ See *id.* at 11917-27 ¶¶ 127-165.

⁶⁷ See *id.* at 11918 ¶ 129, 11923-26 ¶ 150-159 (proposing various mechanisms to facilitate sharing between new and existing licensees in the 27.5 GHz - 28.35 GHz band).

should allow current satellite license owners to determine if an extra level of protection is economically appropriate. If not, then the licensees should continue to operate under secondary conditions to fixed and mobile licenses in the new service. CTA, however, does not object to the Commission's proposal to initiate further proceedings to address satellite operations on movable platforms.⁶⁸ Regarding the 37.5-40 GHz bands, the Commission should focus on (i) enabling the deployment of services under the proposed Upper Microwave Flexible Use Service and (ii) allowing a healthy secondary market to invite other uses of the band. If the Commission determines that the FSS should continue in the 37.5-40 GHz bands, then those operations should function on a secondary basis, accepting all interference from terrestrial operations. Further, the Commission should maintain the current prohibition against ubiquitous deployment of space-to-Earth user equipment.⁶⁹

Through sufficiently flexible, market-based, and technology-neutral rules, innovation will thrive in the new Upper Microwave Flexible Use Service and consumers will benefit.

⁶⁸ *Id.* at 11926 ¶ 159. To the extent that the Commission is currently considering applications to provide FSS to movable platforms, the Commission may wish to consider those applications concurrent with the proposed further proceeding.

⁶⁹ *Id.* at 11927 ¶ 160.

VI. CONCLUSION

CTA's members are working diligently to ensure that the ever-increasing consumer demand for high-speed wireless connectivity is met. The mmW spectrum holds promise as a part of the solution to meeting that demand, and CTA looks forward to working with the Commission to fully evaluate and take advantage of the opportunities presented by the mmW bands.

Respectfully submitted,

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