

**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 Operation in the 27.5-28.35 GHz and 37.5-40 GHz Bands)	IB Docket No. 15-256
)	
Amendment of Parts 1, 22, 24, 27, 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 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
)	

REPLY COMMENTS OF CTIA

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REPLY COMMENTS OF CTIA

CTIA respectfully submits these reply comments in response to the *Second Further Notice of Proposed Rulemaking*, which seeks comment on proposed rules that would authorize mobile operations in additional spectrum bands above 24 GHz.¹

I. INTRODUCTION AND SUMMARY.

The record before the Federal Communications Commission (“Commission”) in this proceeding highlights the vital role that millimeter wave spectrum is expected to play in facilitating the development and deployment of 5G services. Countries throughout the world are racing to

¹ *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 (2017) (“*Second Report and Order and FNPRM*”).

identify and allocate spectrum for 5G services, especially in the millimeter wave spectrum bands. In Asia, South Korea is already trialing use of millimeter wave band spectrum during the Winter Olympics and anticipates near-term auctions,² while China has launched a consultation regarding the planning and use of millimeter wave spectrum for 5G.³ In Europe, the EU is considering millimeter wave band spectrum for commercial 5G deployments in 2020,⁴ while Ofcom has sought input on use of millimeter wave band spectrum for 5G service in the UK.⁵ Securing and maintaining U.S. leadership in 5G will require the Commission to prioritize identification and allocation of new millimeter wave band spectrum to supplement the more than five gigahertz already made available predominantly for terrestrial fixed and mobile operations to keep pace with the rest of the world.⁶ In particular, CTIA urges the Commission to:

- Move forward expeditiously to establish auction procedures for bands that have already been allocated for terrestrial services;
- Allocate additional millimeter wave band spectrum for licensed terrestrial use;
- Seek comment on the optimal use of the 25.25-27.5 GHz (“26 GHz”) band;
- Protect existing terrestrial services with a footnote to the Table of Allocations; and
- Reject suggested constraints on the 24.25-24.45 GHz and 24.75-25.25 GHz (“24 GHz”) and 37-40 GHz bands that would inhibit 5G services.

² Doug Irwin, *Korean Telecom to Use 5G at Pyeongchang Winter Olympics*, RADIO MAGAZINE (Feb. 6, 2018), <https://www.radiomagonline.com/trends/korean-telecom-to-use-5g-at-pyeongchang-winter-olympics>.

³ See e.g., Fiona Chau, *China launches consultation on 5G spectrum*, TELECOMASIA.NET (June 9, 2017), <https://www.telecomasia.net/content/china-launches-consultation-5g-spectrum>.

⁴ European Commission Radio Spectrum Committee, Opinion of the RSC pursuant to Advisory Procedure under Article 4 of Regulation 182/2011/EU and Article 4.2 of Radio Spectrum Decision 676/2002/EC (rel. Dec. 8, 2016), https://circabc.europa.eu/sd/a/448dc765-51de-4fc8-b6e0-56ed6a1d0bca/RSCOM16-40rev3%205G%20draft_mandate_C.

⁵ OfCom, Consultation: Fixed Wireless Spectrum Strategy (Dec. 7, 2017), https://www.ofcom.org.uk/_data/assets/pdf_file/0027/108594/Fixed-Wireless-SpectrumStrategy.pdf.

⁶ Comments of CTIA, GN Docket No. 14-177, *et al.*, at 8-9 (filed Jan. 23, 2018) (“CTIA Comments”).

II. THE RECORD SUPPORTS AUCTION AND ALLOCATION OF ADDITIONAL EXCLUSIVE, LICENSED SPECTRUM FOR 5G USE.

A. Commenters Urge the Commission to Promptly Release an Auction Procedures Public Notice for the 24 GHz, 28 GHz, 37/39 GHz, and 47 GHz Bands.

Given the urgent need for millimeter wave spectrum to support 5G deployment, the Commission should move forward immediately with the next steps to holding an auction for the 24 GHz, 27.5-28.35 GHz (“28 GHz”), 37.6-40 GHz (“37/39 GHz”), and 47.2-48.2 GHz (“47 GHz”) spectrum bands that have already been allocated for terrestrial services. A number of other commenters join CTIA in encouraging the Commission to move forward expeditiously to initiate and complete all actions required for proceeding with a millimeter wave band spectrum license auction. For example, T-Mobile notes that “there is no impediment” to the Commission releasing the auction procedures public notice that seeks comment on the managing of a spectrum auction.⁷ AT&T likewise argues that the Commission should move forward with auction rules for these bands as a measure to expedite an auction in the near term.⁸ And other parties similarly support accelerating the process for auctioning millimeter wave spectrum licenses.⁹

⁷ Comments of T-Mobile, GN Docket No. 14-177, *et al.*, at 15 (filed Jan. 23, 2018) (“T-Mobile Comments”); *see also* Letter from Steve B. Sharkey, Vice President of Government Affairs for Technology and Engineering Policy, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 14-177, *et al.*, at 4, 11 (filed Feb. 8, 2018) (restating support for moving quickly to auction the millimeter wave bands allocated for terrestrial mobile use).

⁸ Comments of AT&T, GN Docket No. 14-177, *et al.*, at 4 (filed Jan. 23, 2018) (“AT&T Comments”).

⁹ *See, e.g.*, Comments of Competitive Carriers Association, GN Docket No. 14-177, *et al.*, at 10 (filed Jan. 23, 2018) (“CCA Comments”) (“CCA reiterates its request that the Commission make more mmW spectrum available to competitive carriers by exploring all possible means to accelerate an expeditious auction of *Spectrum Frontiers* spectrum.”); Comments of Consumer Technology Association, GN Docket No. 14-177, *et al.*, at 4 (filed Jan. 23, 2018) (“CTA Comments”) (“Making mmW spectrum available on a lightly licensed and unlicensed basis while also providing a roadmap for the release of spectrum in the pipeline are key to sustaining the momentum for developing and deploying 5G networks.”); Comments of Nokia, GN Docket No. 14-177, *et al.*, at 2 (filed Jan. 23, 2018) (“Nokia Comments”).

While CTIA recognizes that the Commission must address the underlying issues associated with the initial payment deposit requirements for auctions, the record nevertheless supports the prompt adoption of a public notice setting forth auction procedures. The Commission should, at a minimum, move forward on the process and procedure for the millimeter wave band spectrum license auctions, or it will risk losing its current momentum and leadership position in identification and licensing of spectrum for 5G services.

B. The Commission Should Rapidly Allocate Additional Spectrum For Licensed Terrestrial Use in the 29 GHz, 31 GHz, 32 GHz, 42 GHz, and 50 GHz Bands.

The record demonstrates that, while the initial spectrum allocations in the 24 GHz, 28 GHz, 37/39 GHz, and 47 GHz bands are a critical down payment towards developing a comprehensive 5G ecosystem, commenters express a strong desire for additional spectrum. Nokia, for instance, supports allocations and service rules for the 32 GHz, 42 GHz, and 50 GHz bands, as well as use of the 24.25-28.35 GHz band for 5G.¹⁰ Other commenters support allocation and service rules for the remaining Local Multipoint Distribution System (“LMDS”) spectrum—*i.e.*, 29.1-29.25 GHz (“29 GHz”), 31-31.3 GHz (“31 GHz”)—as well as the 32 GHz, 42 GHz, and 50 GHz bands.¹¹

Additionally, the National Radio Astronomy Observatory (“NRAO”) suggests some minor changes to the T-Mobile compatibility study to protect radio astronomy uses adjacent to the 32 GHz band, that could provide smaller separation distances between radio astronomy sites and 5G systems.¹²

With these modifications, it appears that the use of the 32 GHz band for 5G services is practical and

¹⁰ Nokia Comments at 6.

¹¹ AT&T Comments at 4-5; T-Mobile Comments at 11; CCA Comments at 10; CTA Comments at 5.

¹² *Ex Parte* Presentation of NRAO, GN Docket No. 14-177, *et al.*, (filed Feb. 7, 2018). *See also* Letter from Steve Sharkey, Vice President, Government Affairs – Technology and Engineering Policy, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 14-177, *et al.* (filed Oct. 2, 2017).

acceptable to the radio astronomy community and eliminates one of the primary hurdles associated with licensing this spectrum band for terrestrial fixed and mobile 5G.

In contrast to the broad record support for the identification and allocation of new 5G service spectrum, only Iridium opposes the use of the 29.1-29.25 GHz band for terrestrial operations. Iridium argues that the benefits of using the band for terrestrial operations are small, while the risk of disruption to Iridium's operations would be considerable.¹³ However, Iridium holds only five licenses that would be impacted if terrestrial operations were permitted.¹⁴ Put differently, Iridium argues that the operations of its handful of earth stations sites in Alaska, Arizona, and Hawaii should preclude use of the entire band throughout the country.¹⁵

The Commission should reject this argument. Such a broad reservation of spectrum rights on behalf of a limited number of parties would be antithetical to the public interest and inconsistent with the rights afforded to other similarly situated LMDS licensees. The Commission should instead modify its Part 30 rules to allow for mobile terrestrial use of the 29 GHz and 31 GHz bands or, at a minimum, seek further comment on use of the bands for such service, and provide interference criteria to protect incumbents' use of the band while still allowing widespread mobile use of the spectrum by existing LMDS licensees.

In light of the extensive record demonstrating the need for additional millimeter wave spectrum for 5G, the Commission should continue its publicly announced approach to adopt allocation and service rules for the remaining LMDS, 32 GHz, 42 GHz, and 50 GHz bands for 5G

¹³ Comments of Iridium, GN Docket No. 14-177, *et al.*, at 3 (filed Jan. 23, 2018) ("Iridium Comments").

¹⁴ The Commission's International Bureau Filing System lists five "grandfathered" mobile satellite service Earth-to-space licenses for Iridium in the 29.1-29.25 GHz band: E960131 (Tempe, AZ); E960244 (Chandler, AZ); E960272 (Honolulu, HI); E050282 (Borough, AK); and E060300 (Fairbanks, AK).

¹⁵ Iridium Comments at 3.

services in 2018.¹⁶ The existing allocations, while a promising initial tranche for 5G, should be supplemented to ensure that the nation’s mobile broadband leadership is maintained and to allow a wide variety of entities to obtain sufficient spectrum to deliver the benefits of 5G to all American consumers.

C. The Commission Should Seek Further Comment on Use of the 26 GHz Band.

In response to the *Second Further Notice of Proposed Rulemaking*, commenters offered widespread support for seeking comment on the potential use of the 26 GHz band. Indeed, terrestrial providers,¹⁷ original equipment manufacturers,¹⁸ startups,¹⁹ and stratospheric platform interests²⁰ all encourage the Commission to further explore and/or issue a Notice of Proposed Rulemaking seeking comment on the use of the 26 GHz band.

As commenters note in the record, the 26 GHz band is directly adjacent to the 28 GHz band and nearly adjacent to the 24 GHz band—bands that are both already identified and allocated for terrestrial fixed and mobile services.²¹ By including the 26 GHz band as part of the Part 30 licensing framework, the Commission would deliver a large, nearly contiguous four-gigahertz block

¹⁶ See Statement of Chairman Ajit Pai, *attached to Second Report and Order and FNPRM* (“[T]his isn’t the end of our work in this field, but the beginning. Accordingly, I plan to follow up on today’s achievement by presenting the next Spectrum Frontiers item in the *first half of next year*. This will continue our commitment to enabling access to these high-band frequencies.”) (emphasis added).

¹⁷ T-Mobile Comments at 11-12; AT&T Comments at 5.

¹⁸ See, e.g., Nokia Comments at 6-7 (encouraging the Commission to “open the whole 24.25 to 28.35 GHz range”).

¹⁹ Comments of Starry, GN Docket No. 14-177, *et al.*, at 3 (filed Jan. 23, 2018) (“Starry Comments”) (urging the Commission to “seek comment on adding the 26 GHz band to its inventory for fixed and mobile wireless services”).

²⁰ Comments of Elefante, GN Docket No. 14-177, *et al.*, at 2 (filed Jan. 23, 2018) (“Elefante Group supports initiation of a proceeding to make a Fixed Service allocation, as well as to adopt technical, operational, and licensing rules, in the 25.25-27.5 GHz band to enable persistent stratospheric communications systems as an important piece of this framework.”).

²¹ CTIA Comments at 9; Nokia Comments at 7; AT&T Comments at 5.

of spectrum for 5G that, as discussed in more detail below, would be globally harmonized. This is especially important given that the 26 GHz band's propagation characteristic would allow wireless providers to deliver better and broader geographic coverage around 5G base station sites and/or longer fixed backhaul applications.²² With a broad amount of nearly contiguous spectrum available for 5G along with improved propagation characteristics, costs for equipment and deployment will be much more economically feasible. Introduction of the 26 GHz band for U.S. terrestrial fixed and mobile services will allow for global economies of scale in the development of user and base station equipment, driving down those costs.

In addition to these benefits, there is significant international interest in the 26 GHz band for 5G use.²³ China, the European Union, and the United Kingdom, for instance, are all evaluating this band for its suitability to support 5G. In light of the growing importance of this band globally, as well as a rare, attractive opportunity to provide nearly four gigahertz of contiguous spectrum for 5G, the Commission should move forward with consideration of the 26 GHz band as expeditiously as possible.

III. THE COMMISSION SHOULD FOCUS ON ENCOURAGING TERRESTRIAL USE OF THE MILLIMETER WAVE SPECTRUM.

A. The Commission Should Protect Terrestrial Services in the Table of Allocations.

In its comments, the Satellite Industry Association ("SIA") suggests that the Commission add the 24 GHz band to the Table of Allocations footnote NG65, which currently states:

In the band 47.2-48.2 GHz, stations in the fixed and mobile services may not claim protection from individually licensed earth stations authorized pursuant to 47 C.F.R. 25.136. However, nothing in this footnote shall limit the right of UMFUS licensees to operate in conformance with the technical rules contained in 47 C.F.R. Part 30. The Commission reserves the right to monitor developments and to

²² See e.g., Comments of Ericsson, GN Docket 14-177, *et al.*, at 10 (filed Sept. 30, 2016) (noting that frequency ranges below 30 GHz have better coverage characteristics).

²³ CTIA Comments at 8-9.

undertake further action concerning interference between UMFUS and FSS, including aggregate interference to satellite receivers, if appropriate.²⁴

CTIA objects to the addition of the 24 GHz band to the Table of Allocations footnote NG65, as suggested by SIA. For one thing, SIA has not offered any evidence to demonstrate why it is appropriate or necessary to add the 24 GHz band to the Table of Allocations footnote. And, importantly, the 24 GHz band has been limited primarily for Broadcast-Satellite Service use rather than unfettered access for Fixed-Satellite Service (“FSS”) earth stations.²⁵ Therefore, there should have been no expectations by the satellite industry that more widespread availability of the band for FSS would be feasible. Given the record support for the need for the 24 GHz band for 5G, the Commission should maintain the limitations on the 24 GHz band for satellite purposes and should move forward to make the band primarily available for terrestrial fixed and mobile services.

To implement this approach, CTIA reiterates its support for the adoption of a new footnote within the Table of Allocations that would demonstrate the U.S. priority that the 24 GHz, 28 GHz, 37/39 GHz, and 47 GHz bands be allocated for terrestrial 5G services, as well as any other spectrum bands it similarly identifies in the future.²⁶ Adopting such a footnote will provide interference protection for terrestrial fixed and mobile operations and the corresponding regulatory certainty that is necessary for innovation. It would also help to signal to the global community that the United States intends to maintain these spectrum bands primarily for terrestrial fixed and mobile services to implement 5G. Moreover, adoption of a footnote about terrestrial-based services will help balance

²⁴ Comments of Satellite Industry Association, GN Docket No. 14-177, *et al.*, at 8 (filed Jan. 23, 2018) (“SIA Comments”).

²⁵ *Second Report and Order and FNPRM* ¶ 90.

²⁶ CTIA Comments at 12-13 (suggesting that the Commission adopt the following footnote text to the Table of Allocations: “**US566.** The following frequency bands in the range 24-50 GHz are identified predominantly for terrestrial mobile and fixed services on a primary basis: (1) 24.25-24.45 GHz; (2) 24.75-25.25 GHz; (3) 27.5-28.35 GHz; (4) 37-40 GHz; and (5) 47.2-48.2 GHz.”).

the impact of the existing footnote,²⁷ which delineates the rights of FSS operators in the 47 GHz band.

B. There Is No Need for Any Additional Technical Protections to Guard Against Aggregate Interference to Satellite Operations.

Only SIA suggests that there is any need to consider aggregate interference from terrestrial operations in the 24 GHz band.²⁸ Other filers, however, argue that any concerns about harmful aggregate interference are overstated and should not deter Commission action on the 24 GHz band.²⁹ Further, the satellite industry has failed to present any evidence suggesting that the Commission needs to revisit its decision concerning aggregate interference. As was the case for the 28 GHz band, satellite parties should be free to file in the open docket created by the Commission any relevant data and analyses that demonstrate any harmful impacts.³⁰ There is no need for any change in the existing requirements placed upon terrestrial licensees to protect against harmful aggregate interference.

C. Any New FSS Use of the 24 GHz Band Should Be Governed by the 28 GHz Sharing Requirements.

In the *Second Further Notice of Proposed Rulemaking*, the Commission proposes to license FSS earth stations in the 24 GHz band on a co-primary basis under the provisions in Section 25.136(d), as revised in the *Second Report and Order* for the 47.2-48.2 GHz band.³¹ Commenters

²⁷ 47 C.F.R. § 2.106, footnote NG65.

²⁸ SIA Comments at 7.

²⁹ See, e.g., T-Mobile Comments at 7 (“The limited nature of [Upper 24 GHz band] operations moot the Commission’s concerns about interference to satellite receivers.”); Nokia Comments at 3 (“Based on a substantial record, the Commission has declined to set specific aggregate interference limits on terrestrial services in prior phases of this proceeding and there is no compelling reason to change course here.”).

³⁰ See generally *Docket Established for 28 GHz Aggregate Interference Analysis*, Public Notice, 32 FCC Rcd 5022 (2017).

³¹ *Second Report and Order and FNPRM* ¶ 94.

are divided on the sharing requirements that should govern the 24 GHz band. For example, SIA asserts that the 24 GHz sharing framework should be modeled on the sharing criteria established for the 47 GHz band, which would give satellite parties additional flexibility in designing their systems and siting gateway earth stations.³² On the other hand, AT&T contends that use of the 24 GHz band should be governed by the sharing criteria used in the 28 GHz band.³³ T-Mobile similarly argues against providing any additional FSS authority in the 24 GHz band.³⁴

Given the record and the need for the 24 GHz band to be primarily available for terrestrial 5G services, the Commission should modify its original proposal to limit any new FSS use to the sharing criteria implemented for the 28 GHz band. The 28 GHz sharing rubric would ensure that the 24 GHz band's use for 5G terrestrial services would be protected from broader FSS use and that coordination would be required before any expanded uses would be permitted.

D. Expanded Use of the 37.5-40 GHz Band for Satellite End-User Equipment Should Again Be Rejected.

In its brief comments, SOM1101 LLC suggests that the Commission should remove the prohibition on satellite end-user equipment in the 37.5-40 GHz band, arguing that the wireless industry's concerns about harmful interference are unfounded.³⁵ This mere one-paragraph comment, however, is essentially a request for reconsideration of a Commission finding in the *Second Spectrum Frontiers Report and Order*. There, the Commission recognized that “the same technologies that will support non-line-of-sight service to mobile users over short distances will also be able to support non-line-of-sight service to fixed users over longer distances,” but found that FSS proponents failed to meet their burden of demonstrating that allowing satellite end-user devices in

³² SIA Comments at 4.

³³ AT&T Comments at 7.

³⁴ T-Mobile Comments at 4-5.

³⁵ Comments of SOM1101 LLC, GN Docket No. 14-177, *et al.*, at 2 (filed Jan. 23, 2018).

37.5-40 GHz is necessary and appropriate.³⁶ It also found that allowing satellite earth stations in the 37.5-40 GHz band presents an unacceptable risk of interference and/or a negative customer experience for satellite broadband consumers.³⁷ The Commission also stated that FSS proponents had not met their burden of demonstrating that allowing satellite end-user devices is both necessary and appropriate.³⁸ Given this background, this request should be rejected as not only outside the scope of the *FNPRM*, but also as failing to address the policy concerns articulated by the Commission in the *Second Report and Order*.

IV. CONCLUSION.

CTIA reiterates its support for the Commission's efforts in this proceeding to identify and allocate additional spectrum for terrestrial mobile and fixed services. Continuing this approach will promote U.S. leadership in the development and deployment of 5G. To best build upon the work already done, the Commission should: (1) promptly issue a public notice on the procedures for upcoming auctions in bands for which it has already adopted service rules; (2) allocate additional spectrum for licensed terrestrial use; and (3) seek further comment on the best use of the 26 GHz band. CTIA also strongly encourages the Commission to protect terrestrial services in the Table of Allocations and reject calls to provide further technical protections against aggregate interference. Finally, CTIA encourages the Commission to apply the 28 GHz sharing requirements to the 24 GHz band and reject arguments that seek expanded use of the 37.5-40.0 GHz band for satellite end-user equipment. These steps are necessary to foster the deployment of next-generation products and services and ensure that the regulatory approach to spectrum in the millimeter wave bands allows for experimentation and does not stifle innovation.

³⁶ *Second Report and Order and FNPRM* ¶ 220.

³⁷ *Id.*

³⁸ *Id.*

Respectfully Submitted,

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