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 Operation	)	IB Docket No. 97-95

COMMENTS OF T-MOBILE USA, INC.

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COMMENTS OF T-MOBILE USA, INC.

T-Mobile USA, Inc. ("T-Mobile")[1/] submits these comments in response to the Second Further Notice of Proposed Rulemaking ("*Second FNPRM*")[2/] in the above-referenced

[1/] T-Mobile USA, Inc. is a wholly-owned subsidiary of T-Mobile US, Inc., a publicly traded company.

[2/] *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, GN Docket No. 14-177, *et al*., FCC 17-152 (rel. Nov. 22, 2017) (subparts referred to

proceedings, in which the Commission seeks comment on further proposed actions to make millimeter wave spectrum available for Fifth Generation ("5G") wireless services and "ensure continued American leadership in wireless broadband[.]"[3/] T-Mobile applauds the Commission's continued efforts to make additional high-band spectrum available for mobile wireless broadband use and urges the Commission to begin the process of auctioning that spectrum this year.

I. INTRODUCTION AND SUMMARY

Over the last five years, consumer demand for wireless broadband has increased dramatically.[4/] This trend – and the corresponding demand for wireless network capacity – will only continue to grow. In fact, it is expected that over the next three years, more than 30 billion connected devices, many part of the so-called "Internet of Things" ("IoT"), will be deployed.[5/] 5G wireless technologies, which will have faster data speeds and lower latency than current technologies, are essential to this future. They will create over two million jobs and add approximately $420 billion to the nation's annual Gross Domestic Product.[6/] Therefore, making

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respectively as the "*Second Report and Order*," "*Second FNPRM*," "*Order on Reconsideration*," and "*Memorandum Opinion and Order*").

3/ *Second FNPRM* ¶ 1.

4/ CISCO, VISUAL NETWORKING INDEX: GLOBAL MOBILE DATA TRAFFIC FORECAST UPDATE, 2016–2021 (Feb. 7, 2017), https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html ("Mobile data traffic has grown 18-fold over the past 5 years."); *see also Wireless Snapshot 2017*, CTIA, https://www.ctia.org/docs/default-source/default-document-library/ctia-wireless-snapshot.pdf (last accessed Dec. 19, 2017) ("Wireless Snapshot 2017") ("2016 mobile data use is 35 times the volume of traffic in 2010.").

5/ *See, e.g.*, SAM LUCERO, IHS TECHNOLOGY, IOT PLATFORMS: ENABLING THE INTERNET OF THINGS 5 (2016) ("IHS forecasts that the IoT market will grow from an installed base of 15.4 billion devices in 2015 to 30.7 billion devices in 2020 and 75.4 billion in 2025[.]").

6/ *See Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities*, CTIA (2017), https://www.ctia.org/docs/default-source/default-document-library/how-5g-can-help-municipalities-become-vibrant-smart-cities-accenture.pdf.

additional spectrum available for 5G wireless broadband is vitally important to maintaining U.S. leadership in wireless technologies and in furthering economic growth.[7/]

As the Commission has recognized, high-, mid-, and low-band spectrum will all be critical to delivering the promise of 5G.[8/] T-Mobile therefore appreciates the Commission's continued efforts to make high-band millimeter wave band spectrum available for terrestrial use. To maximize deployment of 5G technologies in the millimeter wave bands, the Commission should:

- make the 24.75-25.25 GHz band available for terrestrial – and not satellite – operations;
- avoid creating unique performance requirements for IoT and other developing applications at this time;
- require operability across the 24.25-24.45 GHz and 24.75-25.25 GHz bands (together, the "24 GHz band");
- make additional millimeter wave spectrum available for terrestrial use, including the 25.25-27.5 GHz band ("26 GHz band") – which has not previously been addressed in this proceeding and the 31.8-33.4 GHz band ("32 GHz band") and 50.4-52.6 GHz bands ("50 GHz band") – which T-Mobile has demonstrated can support both terrestrial 5G and existing services; and
- immediately initiate the process for conducting an auction of the bands previously allocated in this proceeding – 24 GHz, 28 GHz, 37 GHz, 39 GHz and 48 GHz – and begin a combined auction for those bands in 2018.

7/ *See Second FNPRM* ¶ 1 ("[W]e help ensure continued American leadership in wireless broadband, which represents a critical component of economic growth, job creation, public safety, and global competitiveness.").

8/ *Policies Regarding Mobile Spectrum Holdings*, Report and Order, 29 FCC Rcd. 6133, ¶ 18 (2014) ("As providers deploy next-generation mobile networks, the engineering properties and deployment capabilities of the mix of particular spectrum bands in providers' holdings have become increasingly important."); *see also* Commissioner O'Rielly, *A Mid-Band Spectrum Win in the Making*, FCC (July 10, 2017), https://www.fcc.gov/news-events/blog/2017/07/10/mid-band-spectrum-win-making ("Next generation wireless networks will require high, mid and low band spectrum."); *See Second FNPRM* ¶ 7 ("Our efforts in this proceeding to make mmW spectrum for wireless broadband available are part of the Commission's broader initiative to make available additional spectrum for wireless broadband across a range of frequencies. . . . We will continue these efforts to facilitate access to low-band, mid-band, and high-band spectrum for the benefit of American consumers.").

II. SATELLITE USE OF THE 24.75-25.25 GHz BAND SHOULD BE LIMITED

In the *Second Report and Order*, the Commission made the bands 24.25-24.45 GHz (the "Lower 24 GHz band") and 24.75-25.25 GHz (the "Upper 24 GHz band") available for terrestrial operations under the Part 30 Upper Microwave Flexible Use Service ("UMFUS") rules.[9/] While there is no Fixed Satellite Service ("FSS") allocation in the Lower 24 GHz band, there is a non-federal FSS allocation in the Upper 24 GHz band. The Table of Allocations currently provides Broadcast Satellite Service ("BSS") priority over all other FSS uses in that band, and it restricts FSS use of the 25.05-25.25 GHz band to feeder links for BSS.[10/] Accordingly, of the 700 megahertz in the 24 GHz band the Commission has designated for UMFUS operations, only 300 megahertz – less than half – is allocated for unrestricted FSS use today.

Nevertheless, the Commission proposes co-primary FSS sharing with UMFUS in the entire Upper 24 GHz band, limited to individually licensed earth stations that meet requirements applicable to earth stations in other bands shared with UMFUS (*e.g.*, limitations on population covered and the number of earth station locations in a Partial Economic Area, and a prohibition on earth stations in places where they would preclude terrestrial service to people or equipment that are in transit or are present at mass gatherings).[11/] Under the Commission's proposal, the band would be made available for general FSS uplink operations without restricting these operations to, or affording priority for, BSS feeder links.[12/] The Commission should not adopt

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9/ *See Second Report and Order* ¶¶ 22, 27.

10/ *See Second FNPRM* ¶ 15.

11/ *See id.* ¶ 94.

12/ *See id*.

this proposal, and it should limit FSS sharing with UMFUS in the Upper 24 GHz band to stations that exist today.

There is no need to create additional opportunities for FSS operations in the millimeter wave bands. The Commission already made available 4 gigahertz of spectrum for satellite operations in the *Memorandum Opinion and Order* by reserving the 48.2-50.2 GHz and 40-42 GHz bands for FSS use.[13/] Moreover, the Commission has permitted satellite encroachment of the terrestrial use in the 28 GHz, 37 GHz, and 39 GHz bands through a sharing scheme that it recently further expanded in the *Order on Reconsideration*.[14/] It has taken those steps with no evidence of any demand for satellite broadband capacity. To the contrary, demand for satellite broadband is comparatively low, as the small satellite broadband subscriber base indicates.[15/]

Whatever basis there may have been for allowing satellite use in the 28 GHz, 37 GHz and 39 GHz bands is completely absent with respect to the Upper 24 GHz band. As the Commission acknowledges, there are currently only four active licenses and one pending application for feeder link earth stations in the band, all of them held by DIRECTV.[16/] There is neither existing nor planned general FSS use of the band. Nor has there been any demonstration that the Upper 24 GHz band – in addition to the significant amount of spectrum already made available for satellite operations – is needed to support current or future needs. As noted above, there is little demand for satellite broadband. In contrast, the need for additional terrestrial mobile broadband

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13/ *See Memorandum Opinion and Order* ¶¶ 189, 192.

14/ *See, e.g.*, *Order on Reconsideration* ¶ 127 (relaxing the populations limits for earth station siting).

15/ There are only approximately 1.9 million satellite broadband subscriptions in the entire world. *See* SATELLITE INDUSTRY ASSOCIATION, 2017 STATE OF THE SATELLITE INDUSTRY REPORT 13 (2017), http://www.sia.org/wp-content/uploads/2017/07/SIA-SSIR-2017.pdf.

16/ *See Second Report and Order* ¶ 17.

spectrum is well established,[17/] and the terrestrial mobile industry has put, and will continue to put, its available spectrum to use to meet the demand created by consumer use of data over mobile wireless networks. Based on the above, the Commission should not – as it seems to have here – adopt a policy of reflexively establishing satellite use of spectrum designated principally for terrestrial mobile wireless operations.

Retaining the Upper 24 GHz band primarily for licensed mobile wireless operations in the U.S. would be consistent with international efforts; the band was designated at the 2015 World Radiocommunication Conference ("WRC-15") for further evaluation for primary mobile terrestrial use.[18/] Global harmonization in the band, consistent with International Telecommunication Union ("ITU") efforts, would best promote innovation and investment, allow for efficiency-promoting economies of scale, and produce a robust equipment market, to the benefit of U.S. consumers of mobile wireless broadband products and services. Any increased use of the spectrum for satellite operations, in contrast, will diminish its utility for mobile terrestrial use, which will in turn depress investment in, and ultimately the success of, mobile use of these bands. The Commission must not continue to sacrifice the deployment of mobile terrestrial services in the millimeter wave bands – services for which there is high demand – to meet unproven needs for satellite broadband.

17/ *See supra* Section I; *Second Report and Order* ¶ 22 ("Our priority is making spectrum available quickly so that it can be utilized by potential users, technology developers, and innovators. Given the present demand for both mobile and mmW spectrum, we see no reason to artificially delay this process."). There are approximately 409.1 million mobile broadband subscriptions in the U.S. *See Broadband Portal, Total Fixed and Wireless Broadband Subscriptions by Country*, Organisation for Economic Co-operation and Development (data as of December 2016 available in a downloadable chart), www.oecd.org/sti/broadband/oecdbroadbandportal.htm (last accessed Nov. 27, 2017).

18/ FINAL ACTS WRC-15, WORLD RADIOCOMMUNICATION CONFERENCE, Resolution 238 (2016), http://search.itu.int/history/HistoryDigitalCollectionDocLibrary/4.297.43.en.100.pdf.

Existing operations as of the date of the *Second FNPRM* may be grandfathered. As the Commission observes, there is limited use of the Upper 24 GHz band today, mostly for BSS feeder links. The limited nature of these operations moot the Commission's concerns about interference to satellite receivers.[19/]

III. PERFORMANCE METRICS FOR ALTERNATIVE SERVICES SHOULD BE TEMPORARY AND FLEXIBLE

In the *Report and Order*, the Commission adopted the following performance metrics that licensees must meet at the end of an initial license term: (i) for mobile and point-to-multipoint services in the 28 GHz, 37 GHz (geographic area licenses only), and 39 GHz bands, a licensee must provide coverage to 40% of the population of the license area and must be using the facilities to provide service; (ii) for fixed service, geographic area licensees in the 28 GHz, 37 GHz, and 39 GHz bands must construct and operate at least four links in license areas with less than 268,000 population, and at least one link per 67,000 population in license areas with greater population; and (iii) for satellite, a 28 GHz UMFUS licensee may fulfill build-out requirements by deploying an earth station in the license area that is operational and providing service, but in the 37 GHz and 39 GHz bands, constructing and operating an earth station will fulfill the performance requirement only for the county in which it is constructed, and not for the entire license area.[20/] Licensees who deploy a combination of services will be evaluated on a case-by-case basis.[21/] The Commission also sought comment on performance metrics that could be used

19/ *See Second FNPRM* ¶ 95.

20/ *See Report and Order* ¶¶ 206-209.

21/ *See id.* ¶ 210.

to evaluate the deployment and performance of an IoT-type service,[22/] but declined to adopt any metrics in the *Second Report and Order*, because the record on this issue was limited.[23/]

The Commission seeks comment a second time on whether to adopt a performance metric for UMFUS licenses that may accommodate IoT-type deployments or other innovative services. Specifically, the Commission seeks comment on requiring (i) geographic area coverage of 25% of the license area, or alternatively, (ii) presence in 25% of subset units of the license area, such as census tracts, counties, or some other area.[24/] Under the Commission's proposal, any metric adopted to accommodate IoT services would be available to any UMFUS licensee.[25/] The Commission should not adopt those performance metrics at this time.

It remains too early to develop a definitive metric – or even a list of metrics – to support the use of millimeter wave spectrum for IoT and alternative applications. As the Commission acknowledges, technologies and use cases for millimeter wave spectrum are still being developed.[26/] And performance requirements are more than six years away. Adopting performance metrics now may inadvertently drive application development, when it should be the other way around. While it may be useful for the Commission to establish the type of performance metrics for IoT and similar applications that it has adopted for fixed and mobile/point-to-multipoint applications, the Commission should postpone that effort for several additional years.

22/ *See id.* ¶ 466.

23/ *See Second FNPRM* ¶ 98.

24/ *See id.* ¶ 100.

25/ *See id.* ¶ 103.

26/ *See id.* ¶ 99.

If the Commission nevertheless wishes to establish today a metric applicable to IoT deployments, it should clarify that systems that consist of IoT or similar devices may take advantage of the 40% population coverage requirement it has already adopted for mobile and point-to-multipoint operations in the millimeter wave bands.[27/] IoT devices are generally end user products and are therefore more like mobile devices than any other category of devices that exist today. In addition, as the Commission notes, "[the 40% population] level of coverage strikes the appropriate balance between ensuring sufficient use of the spectrum and allowing licensees flexibility to deploy an emerging technology which may be more suitable for smaller coverage areas."[28/] But even if it makes clear that this metric can apply to IoT deployments, the Commission should remain committed to revisiting the issue of performance metrics tailored to IoT and alternative applications closer to 2024, when uses of the band will be more fully developed and incumbent licensees must meet performance requirements.[29/]

The Commission should also clarify that it will consider performance demonstrations on a case-by-case basis, to accommodate novel uses of the band and facilitate services not contemplated today or in rules adopted later. Case-by-case review should not, however, be used to excuse licensees with novel business plans from actually putting spectrum to use. Millimeter wave spectrum has a history of being underutilized that the Commission must not allow to continue. Therefore, the Commission must rigorously review performance demonstrations to ensure that spectrum is actually being used and must revoke licenses when it is not.

27/ *See Report and Order* ¶ 206.

28/ *See id*.

29/ *See Order on Reconsideration* ¶ 176.

IV. OPERABILITY ACROSS THE 24 GHz BAND SHOULD BE REQUIRED

The Commission proposes to require that equipment capable of operating anywhere within the 24 GHz band be capable of operating across the entire 24 GHz band on all frequencies in both segments of the band.[30/] This would be consistent with the Commission's rules for the 28 GHz, 37 GHz and 39 GHz bands, which also contain operability requirements.[31/] The Commission should adopt this proposal.

As the Commission suggests, an operability requirement for the 24 GHz band will foster equipment development and deployment across the entire band, preventing unequal development in the upper or lower band segments.[32/] In addition, an operability requirement would help prevent the creation of "designer" band classes that can be used for anti-competitive purposes – carriers would not be required to choose between supporting systems in the lower or upper segment, and roaming within the band would be promoted. This would be particularly useful for smaller providers. An operability requirement would also help smaller providers by "allowing [them] to benefit from the scale generated by equipment capable of operating across" the band.[33/]

V. ADDITIONAL MILLIMETER WAVE SPECTRUM BANDS SHOULD BE MADE AVAILABLE FOR TERRESTRIAL USE AND PREVIOUSLY ALLOCATED BANDS SHOULD BE AUCTIONED TOGETHER IN 2018

T-Mobile strongly supports the Commission's continued evaluation of other millimeter wave bands for potential flexible terrestrial wireless use.[34/] As the Commission notes,[35/] there

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30/ *See Second FNPRM* ¶ 108.

31/ *See id.* ¶ 107.

32/ *See id.* ¶ 108 ("Given the segmented nature of the band, we want to ensure that all portions of the band are available for development and deployment of services as a practical matter, and in particular that the lower segment of the band does not suffer from a lack of available equipment.").

33/ *Id.* ¶ 107.

34/ *See id.* ¶ 109.

35/ *See id*.

were other bands specified in the *Further Notice of Proposed Rulemaking* that the Commission did not address in the *Second Report and Order* or *Memorandum Opinion and Order* – particularly, the 32 GHz band, 42-42.5 GHz band ("42 GHz band"), and 50 GHz band.[36/] These bands can and should be made available for mobile terrestrial use. A technical study submitted by T-Mobile, for instance, demonstrates that 5G deployments in the 32 GHz and 50 GHz bands can coexist with existing radio astronomy services ("RAS") and the Earth Exploration Satellite Service ("EESS").[37/] Notably, this study relied on conservative inputs that overstate the potential likelihood of interference to RAS and EESS operations. The study shows that even under worst-case assumptions and conditions the Commission can protect RAS, EESS, and other passive services against harmful interference by adopting modest operating constraints on new 5G broadband services.[38/] T-Mobile urges interested parties to review this study and provide further evaluation of the 32 GHz and 50 GHz bands, so that the Commission can designate that spectrum, along with the 42 GHz band, for mobile wireless use as soon as possible. The Commission should also immediately begin the process of assessing, with the National Telecommunications and Information Administration ("NTIA"), any accommodations to incumbent operations that may be necessary in order to make these bands available for mobile terrestrial wireless use.

The Commission should also continue to examine other bands for terrestrial mobile operations. For instance, the 26 GHz band[39/] has been designated for study by the ITU for

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36/ *See Second Report and Order* n.35.

37/ *See* Letter from Steve Sharkey, Vice President, Government Affairs, Technology and Engineering Policy, T-Mobile USA, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177 (filed Oct. 2, 2017).

38/ *See id.* at 1-2.

39/ Currently, in the 25.25-25.5 GHz band segment, there are federal and non-federal allocations for Inter-Satellite links and standard frequency and time signal-satellite service, and federal fixed and mobile

mobile use,[40/] and along with the Upper 24 GHz band and the 28 GHz band, would result in the creation of a contiguous 3.6 gigahertz block of spectrum (24.75 – 28.35 GHz) for mobile wireless operations.

In addition, the Commission should re-examine potential mobile terrestrial use of the remainder of the LMDS band – the A2 (29.10-29.25 GHz), A3 (31.075-31.225 GHz), and B (31.00-31.075 GHz and 31.225-31.30 GHz) blocks. Numerous parties have urged the Commission to supplement the 28 GHz UMFUS spectrum with other segments of the LMDS band,[41/] and as they have noted, "[a]pplying the new flexible-use rules to the A2, A3, and B portions of the LMDS band as well would promote investment and innovation in 5G technologies and avoid unnecessary inefficiencies."[42/]

While some of these additional bands may be under consideration in international fora for potential re-designation, the Commission and NTIA should proceed with evaluation of the bands for potential use on a domestic basis. As the Commission recognized when it decided to designate the 28 GHz band for terrestrial mobile use, the U.S. need not always follow international action when the domestic public interest dictates a contrary approach.[43/] More

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allocations. The 25.5-27 GHz band segment contains federal and non-federal allocations for the Space Research Service, Inter-Satellite links, and standard frequency and time signal-satellite service, and federal allocations for mobile, fixed, and Earth Exploration Satellite Service. The 27-27.5 GHz band segment contains federal and non-federal allocations for Inter-Satellite links, and federal mobile and fixed allocations.

40/ FINAL ACTS WRC-15, WORLD RADIOCOMMUNICATION CONFERENCE, Resolution 238 (2015), http://search.itu.int/history/HistoryDigitalCollectionDocLibrary/4.297.43.en.100.pdf.

41/ *See, e.g.*, Verizon Comments, GN Dkt. No. 14-177, at 4-5 (filed Sept. 30, 2016); Comments of Straight Path Communications Inc., GN Dkt. No. 14-177, *et al*., at 3-5 (filed Sept. 30, 2016); Comments of Nextlink Wireless LLC, GN Dkt. No. 14-177, *et al*., at 3-17 (filed Sept. 30, 2016).

42/ Verizon Reply Comments, GN Dkt. No. 14-177, at 1 (filed Feb. 24, 2017).

43/ *See Report and Order* ¶ 25 ("Although WRC-15 omitted 27.5-28.35 GHz from a list of mmW bands that it invited ITU-R to study for mobile service, the record in this proceeding makes it abundantly clear that there are significant benefits to authorizing mobile use in the 28 GHz band regardless of that international decision.").

importantly, FCC and NTIA action now will allow the U.S. to take a critical leadership position in the designation of millimeter wave spectrum for mobile terrestrial wireless use, allowing U.S. consumers and businesses to enjoy the benefits of 5G millimeter wave operations sooner.

In addition to making more spectrum available, the Commission should swiftly auction the millimeter wave spectrum that it has already allocated for terrestrial operations – the 28 GHz, 37 GHz, 39 GHz, 24 GHz and 47 GHz bands – in 2018. An auction in 2018 would be consistent with manufacturer statements that equipment will begin to be available for these bands in 2019 and 2020.[44/] Moreover, several major carriers have already acquired, or are about to acquire, significant millimeter wave spectrum holdings in the secondary market.[45/] Verizon's millimeter wave holdings, in particular, are even greater than it initially represented to the Commission. In particular, in justifying its assertion that its acquisition of Straight Path Spectrum, LLC would not cause competitive harm, Verizon stated that it would ***never*** have access to spectrum leased by Nextlink Wireless, LLC ("Nextlink") (which it also acquired) to Vivint, Inc. ("Vivint") based on Vivint's "bargain purchase option." [46/] Reversing its assertion after the pleading cycle in the

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44/ *See, e.g.*, *Making 5G a reality: Addressing the strong mobile broadband demand in 2019 & beyond*, QUALCOMM & NOKIA, 19 (Sept. 2017), https://onestore.nokia.com/asset/201491/Nokia_Qualcomm_Making_5G_a_reality_White_Paper_EN.pdf (discussing planned 2019 equipment launches that will support 5G in the millimeter wave bands).

45/ *See Application of Verizon Communications Inc. and Straight Path Communications, Inc. for Consent to Transfer Control of Local Multipoint Distribution Service, 39 GHz, Common Carrier Point-to-Point Microwave, and 3650-3700 MHz Service Licenses*, Memorandum Opinion and Order, DA 18-52 (rel. Jan. 18, 2018) (approving transfer of 28 GHz and 39 GHz licenses from Straight Path to Verizon); *Application of Cellco Partnership d/b/a Verizon Wireless and XO Holdings For Consent to Transfer Control of Local Multipoint Distribution Service and 39 GHz Licenses*, Memorandum Opinion and Order, 32 FCC Rcd. 10125 (2017). (approving transfer of 28 GHz and 39 GHz licenses from XO Holdings to Verizon); *Application of AT&T Mobility Spectrum LLC and FiberTower Corporation for Transfer of Control of Licenses*, ULS File Nos. 0007652635 and 0007652637 (filed Feb. 13, 2017) (seeking transfer of 24 GHz and 39 GHz licenses from FiberTower to AT&T).

46/ *See Application of Verizon Communications Inc. and Straight Path Communications, Inc. for Consent to Transfer Control of Local Multipoint Distribution Service, 39 GHz, Common Carrier Point-to-Point Microwave, and 3650-3700 MHz Service Licenses*, Straight Path Spectrum, LLC and Verizon Joint Opposition to Petitions, ULS File No. 0007783428 at 13, n.46 (filed Aug. 18, 2017) (arguing that

relevant transaction ended, Verizon later informed the Commission that it entered into an agreement to terminate the Vivint leases (along with Vivint's option to acquire the underlying licenses), asserting that its acquisition of the Vivint-optioned spectrum would still leave it under the updated millimeter wave spectrum screen.[47/]

Verizon's actions further support T-Mobile's request that the Commission auction all available millimeter wave spectrum beginning in 2018. Delaying auction of the remaining allocated millimeter wave spectrum will allow a small number of entities to dominate millimeter wave band holdings for the next few years, giving those entities a significant competitive advantage. In order to prevent a select few carriers from having a competitive advantage detrimental to consumers, the millimeter wave spectrum that has been allocated thus far should be made available through auction as soon as practicable. As the Commission has found that the millimeter bands are substitutable,[48/] they should be auctioned together to offer bidders maximum flexibility.

The Commission has observed that it is unable to hold a large spectrum auction until the Communications Act is amended to address the issue of financial institutions being unwilling to accommodate the holding of upfront payments.[49/] But there are many important steps that precede the collection of upfront payments. The Commission must issue new licenses in the 24

Verizon does not have access to 28 GHz spectrum Nextlink leased to Vivint and that "Verizon never will, because Vivint holds a bargain purchase option to acquire the spectrum in each lease for only one dollar per lease").

47/ *See* Letter from Adam D. Krinsky, Counsel to Verizon Communications Inc. to Marlene H. Dortch, Secretary, FCC, ULS File No. 0007783428 (filed Dec. 26, 2017).

48/ *See Second Report and Order* ¶ 71 (declining to adopt pre-auction limits in the 24 GHz and 47 GHs bands and noting that "[t]he Commission found it unnecessary to apply band-specific aggregation limits in [the 28 GHz, 37 GHz, and 39 GHz] bands because any technical differences among the bands were not sufficient to affect significantly how these spectrum bands might be used").

49/ *See id.* ¶ 6.

GHz, 28 GHz and 39 GHz bands to incumbent licensees, covering mobile operations. It must also "repack" the 39 GHz band to create more opportunities for 200 megahertz-wide channels.[50/] And, consistent with its usual practice, it must issue a Public Notice proposing procedures for a proposed auction. There is no impediment to the Commission taking those steps immediately so that when the Communications Act is amended or the issue of upfront payment collection is otherwise addressed, the Commission is already in a position to initiate an auction. Similarly, while questions regarding the 37-38.6 GHz band in general and the operability requirements applicable to the band remain open, the Commission should nevertheless proceed to create a framework for the auction of that spectrum (including the entire 37.6-40 GHz band), pending any adjustments necessary based on its further proceedings.[51/]

Expanding the number of bands available and quickly auctioning spectrum that has already been made available are especially critical in view of the Commission's proposal to eliminate the pre-auction spectrum holdings limit of 1250 megahertz in the 28 GHz, 37 GHz and 39 GHz bands[52/] – a proposal T-Mobile opposes. Pre-auction limits prevent the consolidation of spectrum in the hands of only a few entities, thereby helping to ensure competition, diversity of

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50/ *See Report and Order* ¶¶ 97-100. T-Mobile notes that AT&T recently submitted an alternative methodology for repacking the 39 GHz band – by issuing vouchers to incumbent licensees that could be used in an auction for 39 GHz spectrum. *See* Letter from Alex Starr, Assistant Vice President – Senior Legal Counsel, AT&T Services, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177 (filed Dec. 12, 2017). T-Mobile appreciates the merit of the AT&T proposal and believes that both it, or the repacking approach the Commission announced in the *Second Report and Order* can likely produce the desired outcome of making the 39 GHz band more suitable for wider-bandwidth channels. T-Mobile expects to file more information in the near future regarding which approach it believes is the most efficient to provide an orderly rationalization of the band and allows the Commission to auction licenses as quickly as possible. Either approach will likely require that the Commission issue a Public Notice providing further information about the process it plans to adopt and how that process will be implemented. The Commission should issue that Public Notice promptly.

51/ *See Second Report and Order* n.35.

52/ *See Second FNPRM* ¶ 105.

ownership, and a healthy device ecosystem. The Commission must at least continue to engage in post-auction aggregation analysis, consistent with its secondary market policies. Nevertheless, making the spectrum already allocated available and allocating additional spectrum for mobile wireless broadband will help address millimeter wave band spectrum concentration.

VI. CONCLUSION

Millimeter wave spectrum will help propel economic growth and make advanced and innovative 5G services available to the American public. To ensure the greatest deployment of 5G technologies, the Commission should:

- make the 24.75-25.25 GHz band available for terrestrial – and not satellite – operations;
- avoid creating unique performance requirements for IoT and other developing applications at this time;
- require operability across the 24 GHz band;
- make additional millimeter wave spectrum available for terrestrial use, including the 26 GHz band – which has not previously been addressed in this proceeding and the 32 GHz and 50 GHz bands – which T-Mobile has demonstrated can support both terrestrial 5G and existing services; and
- immediately initiate the process for conducting an auction of the bands previously allocated in this proceeding – 24 GHz, 28 GHz, 37 GHz, 39 GHz and 48 GHz – and begin a combined auction for those bands in 2018.

Respectfully submitted,

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