

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	IB Docket No. 16-185
2019 World Radiocommunication Conference	)	
Advisory Committee		

**COMMENTS OF T-MOBILE USA, INC.**

T-Mobile USA, Inc. (“T-Mobile”)<sup>1/</sup> submits the following in response to the Public Notice issued by the International Bureau, seeking comments on the draft recommendations provided by the World Radiocommunication Conference Advisory Committee (“WAC”) on several issues that will be considered at the 2019 World Radiocommunication Conference (“WRC-19”) and the draft proposals provided by the WAC on which no consensus was reached.<sup>2/</sup>

**II. INTRODUCTION AND SUMMARY**

Spectrum management is a key component of U.S. efforts to lead the deployment of Fifth Generation (“5G”) wireless technology and services. The Commission has already taken, and is expected to continue to take, important actions domestically to promote 5G deployment. It is critical that the Commission support recommendations for proposals the U.S. will take internationally that are consistent with those priorities.

But WRC-19 decisions will not merely be about spectrum designated in the U.S. for wireless networks. WRC-19 will identify spectrum for International Mobile Telecommunications (“IMT”) designation, facilitating worldwide harmonization of spectrum for

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<sup>1/</sup> T-Mobile USA, Inc. is a wholly owned subsidiary of T-Mobile US, Inc., a publicly traded company.

<sup>2/</sup> *International Bureau Seeks Comment on Recommendations Approved by World Radiocommunication Conference Advisory Committee*, Public Notice, DA 19-172 (rel. Mar. 11, 2019) (“Public Notice”).

wireless networks. Global spectrum harmonization will promote innovation and investment because of efficiency-producing economies of scale and scope. And economies of scale and scope will also result in benefits to U.S. consumers and businesses. That is why the U.S. must continue to take a leadership role in international spectrum matters.

In particular, with regard to the draft proposals in Attachment A to the Public Notice, the Commission should:

- Support adoption of an IMT designation for the 45.5-47.2 GHz and 50.4-52.6 GHz bands.
- Support Fixed Service (“FS”) backhaul in the 70/80 GHz bands for 5G operations.

With regard to the draft proposals in Attachment B to the Public Notice for agenda items to be considered at WRC-23:

- The Commission should ensure that they are aligned with U.S. priorities. A number of these proposals target key bands that the Commission has already identified for 5G deployments, particularly the 28 GHz, 37 GHz, 39 GHz and 47 GHz bands, in addition to the 70/80 GHz bands where the Commission has highlighted the importance of providing an opportunity for future growth of the fixed service in these bands, as demand for 5G backhaul increases. The Commission should therefore not adopt proposals for future agenda items seeking to expand the use of these bands to additional services.

### **III. THE U.S. SHOULD CONTINUE TO SUPPORT DESIGNATION OF MILLIMETER WAVE BANDS FOR IMT AND OTHER TERRESTRIAL USES**

#### **A. 27.5-30 GHz (Documents WAC/089 and WAC/093 – Agenda Item 10)**

Document WAC 089 recommends that the U.S. propose an agenda item for WRC-23 that

would consider the use of the 27.5-30 GHz band for satellite-to-satellite links under the FSS allocation. Document WAC/093 recommends that the U.S. propose, for consideration at WRC-23, an agenda item covering possible use of the same band by earth stations in motion (“ESIMs”) communicating with non-geostationary orbit (“NGSO”) space stations in the fixed-satellite service (“FSS”). T-Mobile opposes the inclusion of this band in both of these proposals, which could further diminish use of the band for terrestrial wireless operations.

The 27.5-28.35 GHz band (“28 GHz band”) was designated in the *Spectrum Frontiers Report and Order* for 5G mobile terrestrial operations,<sup>3/</sup> and the Commission recently concluded an auction of the 28 GHz band for Upper Microwave Flexible Use Service (“UMFUS”) licenses.<sup>4/</sup> The U.S. proposals on any future agenda item must be guided by those actions – including Commission rules permitting only limited earth stations. In the *Spectrum Frontiers Report and Order*, the Commission enabled sharing in the 28 GHz band between terrestrial wireless use and FSS earth stations. The Commission only envisioned minimum use by earth stations in the band, where only a small area is encumbered<sup>5/</sup> and satellite operators are secondary to wireless.<sup>6/</sup> While the Commission, “create[d] a path to expand satellite gateways that could add new sites,”<sup>7/</sup> it limited new earth stations in the 28 GHz band in the same manner that it limited new earth stations in the 37 GHz band.<sup>8/</sup> Proposals seeking to expand the use of

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<sup>3/</sup> *Use of Spectrum Bands Above 24 GHz For Mobile Radio Service, et al.*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, ¶ 27 (2016) (subparts referred to respectively as the “*Spectrum Frontiers Report and Order*” and “*Spectrum Frontiers Further Notice of Proposed Rulemaking*”).

<sup>4/</sup> *See Auction of 28 GHz Upper Microwave Flexible Use Service Licenses for Next-Generation Wireless Services Closes; Gross Winning Bid Amounts Announced for Auction 101*, Public Notice, DA 19-23 (rel. Jan. 31, 2019).

<sup>5/</sup> *Spectrum Frontiers Report and Order*, ¶ 47.

<sup>6/</sup> *Id.* ¶¶ 43, 47.

<sup>7/</sup> *Id.* ¶ 47.

<sup>8/</sup> *Id.* ¶ 54 (“First, we will authorize no more than three locations in each county where FSS may deploy earth stations on a protected basis. Second, an FSS applicant must demonstrate in its license application that

the band to NGSO ESIMs or for satellite-to-satellite links are inconsistent with those rules and could cause harmful interference to 5G operations, adversely affecting and further complicating coexistence with UMFUS licensees.

**B. 37.5-39.5 GHz (Documents WAC/090 and WAC/093 – Agenda Item 10)**

Document WAC/090 recommends that the U.S. propose for inclusion in the agenda for WRC-23 studies for a possible new allocation for the 37.5-39.5 GHz band for reverse direction operations for gateway earth stations in the FSS.<sup>9/</sup> Document WAC/093 similarly recommends that the U.S. propose for inclusion in the agenda for WRC-23 studies of the same band for possible use by ESIMs communicating with NGSO space stations in the FSS.<sup>10/</sup>

T-Mobile opposes the inclusion of the band in both of these proposals, which could lead to further impediments to the use of the 37 GHz band (37.6-38.6 GHz) and the 39 GHz band (38.6-40 GHz) bands for terrestrial wireless systems. Supporting a proposal to potentially designate the 37-39.5 GHz band for FSS or NGSO ESIMs would be inconsistent with domestic policy.<sup>11/</sup> The frequencies at issue are part of the 37 GHz and 39 GHz bands, which the

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the permitted interference zone around its earth station, which we will define as the contour within which FSS licensees generate a power flux density (PFD), at 10 meters above ground level, of no more than -77.6 dBm/m2 /MHz, together with any preexisting earth stations located in the same county on a protected basis, will, in the aggregate, cover no more than 0.1 percent of the population of the county license area where the earth station is located. Third, the applicant must show that the permitted interference zone does not infringe upon any major event venue, arterial street, interstate or U.S. highway, urban mass transit route, passenger railroad, or cruise ship port . . . Fourth, prior to filing its application, if there is an existing 28 GHz UMFUS licensee in the county where it is proposing to locate its earth station, the earth station applicant must coordinate its operation with the existing UMFUS licensees using the coordination procedures contained in Section 101.103(d) of the Commission's rules.”).

<sup>9/</sup> Public Notice, Attachment B at 32.

<sup>10/</sup> *Id.* at 49-50.

<sup>11/</sup> The draft proposals both contend that the proposals are necessary because consumer demand for satellite broadband is growing. *See* Public Notice, Attachment B at 32, 49-50. But, as T-Mobile pointed out in the *Spectrum Frontiers* proceeding, that is not true. *See, e.g.,* Reply Comments of T-Mobile USA, Inc., GN Docket No. 14-177, *et al.*, at 12-13 (filed Oct. 31, 2016). Demand for terrestrial wireless, on the other hand, continues to skyrocket.

Commission authorized for licensed 5G mobile terrestrial use and fixed UMFUS.<sup>12/</sup> Moreover, the Commission announced that it will auction both the 37 GHz and 39 GHz bands later this year as part of its 5G Fast Plan – the Commission’s comprehensive strategy to Facilitate America’s Superiority in 5G Technology.<sup>13/</sup>

While the Commission authorized licensed mobile and fixed use of the 37 GHz and 39 GHz bands, it also adopted sharing frameworks in both bands that permit satellite use of the bands under certain conditions.<sup>14/</sup> In the 39 GHz band, the Commission allows FSS use of the band for a limited number of individually licensed earth stations.<sup>15/</sup> The proposals in Documents WAC/090 and WAC/093 go well beyond what the Commission has already considered to be appropriate use of the band for satellite operations. The full benefit of deploying this spectrum for mobile use in the U.S. can best be realized by harmonizing the allocation of the full band internationally. Accordingly, the U.S. should not support the inclusion of the band in these proposals to the WRC-23 agenda.

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<sup>12/</sup> *Spectrum Frontiers Report and Order*, ¶¶ 76, 105 (2016).

<sup>13/</sup> *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Service, et al.*, Fourth Further Notice of Proposed Rulemaking, 33 FCC Rcd 7674, ¶ 16 (2018) (“*Spectrum Frontiers Fourth Further Notice of Proposed Rulemaking*”); *The FCC’s 5G FAST Plan*, FCC, <https://www.fcc.gov/5G>.

<sup>14/</sup> The sharing framework in the 37 GHz band permits three FSS earth stations per county, up to a maximum of 15, in each Partial Economic Area (“PEA”), so long as: (1) the earth station defines a protection zone where no terrestrial operations may be located; (2) there are no more than two protection zones in each PEA; (3) the protection zones, taken together, do not cover more than 0.1 percent of the PEA’s population; (4) the earth station does not infringe on any interstate, freeway, or other principal arterial; and (5) the earth station coordinates with terrestrial fixed and mobile licensees who license areas overlap with the protection zone so that the protection zone does not include existing terrestrial operations. *Spectrum Frontiers Report and Order*, ¶ 93; *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, ¶¶ 114-139 (2017) (subparts referred to respectively as the “*Spectrum Frontiers Second Report and Order*,” “*Spectrum Frontiers Second FNPRM*,” “*Spectrum Frontiers Order on Reconsideration*,” and “*Spectrum Frontiers Memorandum Opinion and Order*”).

<sup>15/</sup> *See Spectrum Frontiers Memorandum Opinion and Order*, ¶ 220.

**C. 45.5-47.2 GHz (Document WAC/082 – Agenda Item 1.13)**

Agenda Item 1.13 considers the identification of frequency bands – including the 45.5-47.2 GHz band – for the future development of IMT,<sup>16/</sup> in accordance with Resolution 238, which invited the ITU to determine the spectrum needs for terrestrial systems in bands between 24.25 GHz and 86 GHz and conduct sharing and compatibility studies for the 45.5-47.2 GHz band, among others.<sup>17/</sup>

T-Mobile strongly supports U.S. adoption of View A of Document WAC/082, which would add an IMT identification to the band, while preserving administrations' ability to designate the band for other purposes.<sup>18/</sup> In the U.S., the Commission has already taken the important step of authorizing the adjacent 47.2-48.2 GHz band for fixed and mobile operations under the UMFUS rules.<sup>19/</sup> The full benefit of deploying the 45.5-47.2 GHz band for mobile use in the U.S. can best be realized by harmonizing the allocation of the band, with the 47.2-48.2 GHz band, internationally. As View A explains, “[l]arge amounts of spectrum will be needed” to support future IMT growth.<sup>20/</sup> Facilitating mobile use within that tuning range by other administrations will expand the range and number of devices using that spectrum, promoting economies of scope and scale.

Designating the full 45.5-47.2 GHz band for mobile operations will neither disturb existing Commission decisions regarding this frequency range nor pre-judge future domestic or international allocation decisions – it will merely promote the flexibility necessary to permit

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<sup>16/</sup> Public Notice, Attachment A at 26.

<sup>17/</sup> Resolution 238 (WRC-15), [https://www.itu.int/dms\\_pub/itu-r/oth/0c/0a/R0C0A00000C0014PDFE.pdf](https://www.itu.int/dms_pub/itu-r/oth/0c/0a/R0C0A00000C0014PDFE.pdf).

<sup>18/</sup> Public Notice, Attachment A at 27-30.

<sup>19/</sup> *Spectrum Frontiers Second Report and Order*, ¶ 47.

<sup>20/</sup> Public Notice, Attachment A at 28.

global development of devices throughout the band. View A points out that Mobile Satellite Service (“MSS”) and Mobile Service can coexist in the band, with large margins protecting MSS.<sup>21/</sup>

**D. 47.2-50.2 GHz (Document WAC/089 – Agenda Item 10)**

Document WAC/089 recommends that the U.S. propose for inclusion in the agenda for WRC-23 consideration of the use of the 47.2-50.2 GHz band for satellite-to-satellite links under the FSS allocation.<sup>22/</sup> T-Mobile opposes any expanded use of the band for uses other than terrestrial wireless. As discussed above, the Commission has identified the 47.2-48.2 GHz band (“47 GHz band”) as part of the 5G FAST Plan,<sup>23/</sup> and the Commission plans to auction the band later this year.<sup>24/</sup> The 47.2-48.2 GHz band is therefore positioned to play a critical role in the deployment of 5G services using millimeter wave spectrum in the U.S. Additionally, the U.S. submitted a proposal to CITEL, urging it to identify the 47 GHz band for IMT.<sup>25/</sup> The U.S. should therefore not include this band as proposed in Document WAC/089 because it is inconsistent with domestic policies. Moreover, identifying the entire 47.2-50.2 GHz band for IMT will harmonize the band for global roaming and economies of scale.

**E. 50.4-52.6 GHz (Documents WAC/083, WAC/089, WAC/093 – Agenda Item 1.13 and Agenda Item 10)**

Document WAC/083, in support of Agenda Item 1.13, considers identification of the 50.4-52.6 GHz band for IMT.<sup>26/</sup> WAC/089 recommends that the U.S. propose for inclusion in

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<sup>21/</sup> Public Notice, Attachment A at 28.

<sup>22/</sup> Public Notice, Attachment B at 25-26.

<sup>23/</sup> See *The FCC's 5G Fast Plan*, FCC, <https://www.fcc.gov/5G>.

<sup>24/</sup> See *id.*; *Spectrum Frontiers Fourth Further Notice of Proposed Rulemaking*, ¶ 12.

<sup>25/</sup> *U.S. contributions sent to CITEL PCC.II*, FCC, <https://www.fcc.gov/file/15038/download>. The Commission participates in CITEL through the U.S. State Department.

<sup>26/</sup> Public Notice, Attachment A at 38.

the agenda for WRC-23 consideration of the use of the 50.4-51.4 GHz portion of the band for satellite-to-satellite links under the FSS allocation.<sup>27/</sup> Document WAC/093 recommends that the U.S. propose an agenda item for WRC-23 that would consider the 50.4-52.6 GHz portion of the band for possible use by ESIMs communicating with NGSO space stations in the FSS.<sup>28/</sup>

The 50.4-52.6 GHz band remains under consideration for mobile broadband use in the U.S. In the *Spectrum Frontiers* Further Notice of Proposed Rulemaking, the Commission proposed to authorize fixed and mobile operations under the UMFUS rules.<sup>29/</sup> Accordingly, T-Mobile supports View A to Document WAC/083. View A explains that mobile services can be allocated on a primary basis in the 50.4-52.6 GHz band.<sup>30/</sup> U.S. proposals for future agenda items related to the 50.4-52.6 GHz band must take into account how satellite use of the band will affect the potential use of the band, as permitted in the U.S. To the extent that there remain open issues with respect to the band, U.S. proposals must assume the full use of the band for 5G mobile terrestrial operations under parameters similar to those adopted for other 5G bands. T-Mobile does not support the recommendation that the U.S. propose that the band be considered under Documents WAC/089 and WAC/093 for these reasons.

**F. 71-76 GHz and 81-86 GHz (Documents WAC/084 and WAC/094 – Agenda Item 1.13 and Agenda Item 10)**

Document WAC/084, in support of Agenda Item 1.13, considers the 71-76 GHz and 81-86 GHz bands (“70/80 GHz bands”) for FS backhaul to support 5G mobile broadband.<sup>31/</sup> In contrast, Document WAC/094, in support of Agenda Item 10, proposes including an agenda item

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<sup>27/</sup> Public Notice, Attachment B at 25.

<sup>28/</sup> *Id.* at 50.

<sup>29/</sup> *Spectrum Frontiers Further Notice of Proposed Rulemaking*, ¶ 420.

<sup>30/</sup> Public Notice, Attachment A at 38-39.

<sup>31/</sup> *Id.* at 44-46.



for WRC-23 that would consider NGSO operation in the 70/80 GHz bands.<sup>32/</sup>

The Commission has not foreclosed use of the 70/80 GHz band for mobile wireless deployment in the future, and there is significant interest in the band to support 5G wireless backhaul. The Commission recently reviewed future use of the 70/80 GHz bands in the *Spectrum Frontiers* proceeding,<sup>33/</sup> and it determined that “these bands can play an important role in 5G development by facilitating backhaul and other fixed uses.”<sup>34/</sup> Consequently, it acknowledged that “[i]t is important not only to protect existing links but also to provide an opportunity for future growth of fixed service in these bands as demand for backhaul and other related services increases.”<sup>35/</sup> In addition to the *Spectrum Frontiers* proceeding, the Commission has a separate, ongoing proceeding regarding wireless backhaul in which it is appropriately considering changes to the rules that would facilitate wireless backhaul in the 70/80 GHz bands.<sup>36/</sup> The Commission is also considering two requests for waiver of the rules governing these bands that would further enable wireless backhaul deployment.<sup>37/</sup>

Given the overwhelming interest in and importance of wireless backhaul for 5G

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<sup>32/</sup> Public Notice, Attachment B at 63-64.

<sup>33/</sup> Although the Commission declined to authorize mobile use in the 70/80 GHz bands in the *Spectrum Frontiers Memorandum Opinion and Order*, it explicitly reserved the right to revisit mobile use in these bands as technology develops. See *Spectrum Frontiers Memorandum Opinion and Order*, ¶ 201.

<sup>34/</sup> *Id.* ¶ 200.

<sup>35/</sup> *Id.*

<sup>36/</sup> See *Amendment of Part 101 of the Commission’s Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Second Notice of Inquiry, Order on Reconsideration, and Memorandum Opinion and Order, 27 FCC Rcd 9735 (2012).

<sup>37/</sup> See Aviat Networks, Request for Waiver, WT Docket No. 15-244 (filed Apr. 5, 2013); Aviat Networks, Amendment to Request for Waiver, WT Docket No. 15-244 (filed Mar. 24, 2014); CBF Networks, Inc., Request for Waiver, WT Docket No. 15-244 (filed June 19, 2015); *Wireless Telecommunications Bureau Seeks Comment on Request for Aviat Networks and CBF Networks, Inc. d/b/a Fastback Networks for Waiver of Certain Antenna Requirements in the 71-76 and 81-86 GHz Bands*, DA 15-1166, WT Docket No. 15-244 (rel. Oct. 13, 2015).

operations, T-Mobile agrees with the “no change” recommendation in Document WAC/084 and, for the same reasons, T-Mobile does not support the proposal in Document WAC/094. With respect to Document WAC/084, supporting a “no change” proposal will enable the 70/80 GHz band to accommodate new and existing IMT deployments. In contrast, proposing a future agenda item, as Document WAC/094 would do, that envisions NGSO systems in the band would not be consistent with mobile wireless deployments.

#### **IV. CONCLUSIONS**

T-Mobile appreciates the opportunity to continue to participate in the preparation for WRC-19. U.S. proposals internationally must continue to be driven by actions that have been taken, and are expected to be taken, domestically to support the deployment of 5G terrestrial networks and by the benefits that U.S. consumers and businesses will recognize from global harmonization of spectrum designations.

Respectfully submitted,

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