

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

In the Matter of)
Expanding Flexible Use of the 3.7 GHz to 4.2 GHz) GN Docket No. 18-122
Band)

REPLY COMMENTS OF T-MOBILE USA, INC.

T-Mobile USA, Inc. (“T-Mobile”)^{1/} submits the following reply comments in response to the initial comments to the Public Notice,^{2/} seeking input on the report the Commission is required to issue under Section 605(b) of the Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless Act (“MOBILE NOW Act”) (the “Report”).^{3/} As T-Mobile has recommended, the Commission should adopt a Notice of Proposed Rulemaking (“NPRM”) to develop the issues related to wireless use of the 3.7-4.2 GHz band. Thereafter, the Commission can submit the Report, covering both its findings, and the action that it has taken, in the rulemaking proceeding. Among other things, the rulemaking proceeding can address incumbent relocation from the 3.7-4.2 GHz band and any impact that the use of the 3.7-4.2 GHz band for mobile wireless operations has on use of adjacent spectrum.

^{1/} T-Mobile USA, Inc. is a wholly owned subsidiary of T-Mobile US, Inc., a publicly traded company.

^{2/} *Office of Engineering and Technology, International, and Wireless Telecommunications Bureaus Seek Comment for Report on the Feasibility of Allowing Commercial Wireless Services, Licensed or Unlicensed, to Use or Share Use of the Frequencies Between 3.7-4.2 GHz*, Public Notice, DA 18-446 (rel. May 1, 2018) (“Public Notice”).

^{3/} Consolidated Appropriations Act, 2018, Pub. L. No. 115-141, Division P, the Repack Airwaves Yielding Better Access for Users of Modern Services (“RAY BAUM’S”) Act. Title VI of the RAY BAUM’S Act is the MOBILE NOW Act.

I. ADDITIONAL MID-BAND SPECTRUM IS NEEDED FOR LICENSED WIRELESS USE

The record supports the premise of both Sections 605 (which requires the Commission to submit the Report) and 603 of the MOBILE NOW Act^{4/} – that additional mid-band spectrum is critical for fifth generation wireless (“5G”) services.^{5/} Specifically, commenters agree that reallocating the band for wireless use will help ensure continued U.S. leadership in the development and deployment of next generation technologies. CTIA explains that “[b]y allocating and repurposing a large swath of the 3.7-4.2 GHz band, the Commission will take an important step to promote U.S. leadership in 5G.”^{6/}

Some commenters that support designation of the 3.7-4.2 GHz band for wireless operations also request that the Commission designate the band for particular applications.^{7/} That approach does not represent sound spectrum management and diverges from the Commission’s recent licensing structure. Designating a band for a particular wireless use – such as point-to-multipoint services – would require the Commission to pick technology winners and

^{4/} *Id.* § 603(a)(1)(“ Not later than December 31, 2022, the Secretary, working through the NTIA, and the Commission shall identify a total of at least 255 megahertz of Federal and non-Federal spectrum for mobile and fixed wireless broadband use.); *Id.* § 603(a)(2)(B)(“100 megahertz below the frequency of 6000 megahertz shall be identified for use on an exclusive, licensed basis for commercial mobile use, pursuant to the Commission’s authority to implement such licensing in a flexible manner, and subject to potential continued use of such spectrum by incumbent Federal entities in designated geographic areas indefinitely or for such length of time stipulated in transition plans approved by the Technical Panel under section 113(h) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 923(h)) for those incumbent entities to be relocated to alternate spectrum.”).

^{5/} Comments of Ericsson, GN Docket No. 18-122, at 2 (filed May 31, 2018) (“[T]he 3.7-4.2 GHz band [is] critical to the nation’s 5G spectrum policy, and necessary if the United States is to be a leader in ongoing mid-band global spectrum harmonization effort.”).

^{6/} Comments of CTIA, GN Docket No. 18-122, at 5 (filed May 31, 2018).

^{7/} *See* Comments of the Broadband Access Coalition, GN Docket No. 18-122, at 2 (filed May 31, 2018); Comments of GeoLinks, GN Docket No. 18-122, at 2 (filed May 31, 2018).

losers. As the wireless industry rapidly evolves, designating spectrum for a specific application risks the Commission’s decision becoming almost immediately out of date.

Doing so is also contrary to other Commission allocation decisions in which it appropriately designated spectrum for flexible use. In both the *Spectrum Frontiers* and 3.5 GHz/Citizens Broadband Radio Service (“CBRS”) proceedings, the Commission recognized the benefits of designating spectrum for flexible use.^{8/} Similarly, Verizon points out the “great need for additional flexible use spectrum” for 5G networks.^{9/} Designating the band for a particular application may foreclose other uses of the spectrum, while allocating the spectrum generally for wireless broadband can help satisfy various applications, including mobile wireless broadband. Instead of tailoring the rules to promote one application, the Commission should structure the regulations for the 3.7-4.2 GHz band in a manner that can accommodate a range of wireless applications.

Those rules should permit *exclusive licensed* use of the spectrum, using technology and applications of the licensee’s election. The Commission should not permit use of the 3.7-4.2

^{8/} In the *Spectrum Frontiers* proceeding, the Commission found that flexible use is necessary “given the convergence between fixed and mobile technologies, [because] attempting to define separate bundles of fixed and mobile rights might create unnecessary complexity and be inconsistent with the underlying technologies.” See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5- 28.35 GHz and 37.5-40 GHz Bands*, GN Docket No. 14-177, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, ¶¶ 77, 38 (2016). And in the 3.5 GHz rulemaking, the Commission clarified that the band is “designed to allow new, innovative operations access to flexible, fungible spectrum.” *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550- 3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, ¶ 138 (2015); see also *id.* ¶ 44 (“By adopting a flexible access model across the entire band, we aim to create a versatile 150 megahertz band for shared wireless broadband use that can adapt to market and technological opportunities.”).

^{9/} Comments of Verizon, GN Docket No. 18-122, at 3 (filed May 31, 2018). See also CTIA Comments at 6 (urging the Commission to “free up the bulk of 3.7-4.2 GHz for flexible use.”).

GHz spectrum on a dynamically shared basis, as suggested by some commenters.^{10/} As T-Mobile has demonstrated, exclusive licensed spectrum is the most effective way to spur equipment development and investment in 5G technologies.^{11/} Commenters suggesting that the Commission “extend” the 3.5 GHz/CBRS shared spectrum model to the 3.7-4.2 GHz band would potentially devalue the 3.7-4.2 GHz band.^{12/} While T-Mobile recognizes that the 3.5 GHz and the 3.7-4.2 GHz bands are adjacent, the dynamic, database-sharing approach used in the 3.5 GHz band is not appropriate for the 3.7-4.2 GHz band.

The sharing rules governing the 3.5 GHz band were implemented to accommodate incumbent federal and non-federal users in the band. But those rules – and the resulting three-tiered sharing scheme – are not necessary for the 3.7-4.2 GHz band. As noted below, geographic sharing between terrestrial and satellite operations in the same area is not feasible. Ericsson agrees that “the CBRS model is particularly unsuited to the 3.7-4.2 GHz band” because the “Spectrum Access System (“SAS”) in the CBRS band, offers significant disadvantages in exacting the right kind of value in the 3.7-4.2 GHz band for the Commission” and “it places a level of uncertainty with regard to interference tolerance needed in dense deployment environments.”^{13/} Moreover, it is premature to dedicate more spectrum to dynamic spectrum sharing when there has been no meaningful experience with it in the 3.5 GHz/CBRS band.^{14/}

^{10/} See, e.g., Comments of Federated Wireless, GN Docket No. 18-122, at 3 (filed May 30, 2018).

^{11/} Comments of T-Mobile, USA Inc., GN 17-183, at 7-13 (filed Oct. 2, 2017). Verizon argues that “the promise of the 3.7 GHz band for 5G far outweighs the challenges of adding a new terrestrial mobile allocation to the band,” so the Commission should “allow licensed commercial wireless use” of the band. Verizon Comments at 1.

^{12/} See, e.g., Federated Wireless Comments at 5; Comments of Motorola Solutions, Inc., GN Docket No. 18-122, at 2 (filed May 31, 2018).

^{13/} Ericsson Comments at 6-7.

^{14/} Nor has there been any demonstrable evidence of successful sharing in the 600 MHz white space spectrum either. See *Amendment of Part 15 of the Commission’s Rules for Unlicensed White Space Devices*, Notice of Proposed Rulemaking and Order, 31 FCC Rcd 1657 (2016); *Unlicensed Operation in*

II. THE 3.7-4.2 GHZ BAND CANNOT EFFECTIVELY BE SHARED BETWEEN SATELLITE AND TERRESTRIAL OPERATIONS IN THE SAME GEOGRAPHIC AREA

Consistent with past practice, the Commission should license the 3.7-4.2 GHz band on an exclusive basis. While they endorse different approaches, commenters agree on the preferred outcome.^{15/} AT&T notes that a “centralized clearing mechanism” like an auction would be beneficial to both mobile wireless services and incumbents.^{16/} And Verizon concurs that a market-based approach, such as repacking incumbents, is the “simplest and best solution.”^{17/}

In contrast, shared use of the 3.7-4.2 GHz band would significantly diminish the band’s utility for terrestrial wireless operations. Both wireless and satellite industry representatives agree that it will be challenging to share the same spectrum in the same geographic area.^{18/} CTIA and Intel, Intelsat, and SES, for example, point out that spectrum sharing between wireless and terrestrial services would require large protection zones.^{19/} That is why the Commission must adopt a plan that will result in the immediate transition of some spectrum in most areas to wireless use – with a gradual conversion of the entire band over time.

the TV Broadcast Bands, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807 (2008).

^{15/} Ericsson Comments at 8 (“[T]here is much promise in repurposing the 3.7-4.2 GHz band for mobile broadband use. The record supports a variety of options for clearing the band, and the Commission should consider all of them. Options include an FCC-led process or a market-based model in which the incumbents agree to surrender spectrum rights for payment from new entrants.”).

^{16/} Comments of AT&T, GN Docket No. 18-122, at 3 (filed May 31, 2018).

^{17/} Verizon Comments at 3.

^{18/} See Broadband Access Coalition Comments at 3; Comments of Eutelsat S.A., GN Docket No. 18-122, at 2 (filed May 31, 2018); Comments of Satellite Industry Association, GN Docket No. 18-122, at 1 (filed May 31, 2018).

^{19/} CTIA Comments at 2; Comments of Intel Corporation, Intelsat License LLC, SES Americom, Inc., GN Docket No. 18-122, at 4 (filed May 31, 2018); Comments of the Content Companies, GN Docket No. 18-122, at 6-7 (filed May 31, 2018).

As T-Mobile has noted before, it may be possible to preserve C-band satellite use in rural areas with coordination zones.^{20/} With the use of coordination zones, a limited number of earth stations in rural areas, like Alaska, will likely have little impact on mobile wireless broadband systems. This technique will address concerns by GCI Communication, Alaska Communications, and others.^{21/} While T-Mobile does not agree with all components of the Intel/Intelsat plan,^{22/} it demonstrates that relocation of satellite operations from the 3.7-4.2 GHz band is feasible. Other parties agreed.^{23/} CTIA, for example, argues that the Commission could relocate earth stations “to more remote locations where they can more feasibly be protected from harmful interference.”^{24/} Plans to relocate satellite earth stations from many geographic areas – which can be further developed during the rulemaking proceeding – can be better informed by the additional information the Commission is gathering on earth station use.^{25/}

T-Mobile therefore agrees with other commenters that the Commission should continue efforts to update its earth station database.^{26/} This is necessary because, as Google observes, “nearly 29% of registered locations are not being used for satellite services . . . which does not

^{20/} Reply Comments of T-Mobile, GN 17-183, at 6-7 (filed Nov. 15, 2017); Comments of T-Mobile, GN 17-183, at 15 (filed Oct. 2, 2017).

^{21/} See Comments of GCI Communication Corp., GN Docket No. 18-122, at 3 (filed May 31, 2018); Comments of Alaska Communications, GN Docket No. 18-122, at 4-6 (filed May 31, 2018).

^{22/} See Intel Corporation, Intelsat License LLC, SES Americom, Inc., Comments at 7-8; Comments of iHeart Media, GN Docket No. 18-122, at 4-5 (filed May 31, 2018).

^{23/} See, e.g., Verizon Comments at 3.

^{24/} CTIA Comments at 6.

^{25/} *Temporary Freeze on Applications for New or Modified Fixed Satellite Service Earth Stations and Fixed Microwave Stations in the 3.7-4.2 GHz Band, 90-Day Window to File Applications for Earth Stations Currently Operating in the 3.7-4.2 GHz Band*, Public Notice, DA 18-398 (rel. Apr. 19, 2018).

^{26/} See Comments of Nokia, GN Docket No. 18-122, at 2 (filed May 31, 2018) (“Nokia urges that the Commission require current earth station licensees to improve the accuracy of the Commission’s database.”).

include inactive dishes remaining at registered locations.”^{27/} The Commission must also assess the utility of the full-band, full-arc policy to “maximize the usefulness of the band.”^{28/} As Verizon notes, “[t]he United States can no longer afford the luxury of inefficient licensing of this band in this spectrum-constrained world and in the context of the global race to 5G.”^{29/}

As others recognize, any plan to re-purpose the 3.7-4.2 GHz band for terrestrial use, including the Intel/Intelsat plan, will also require an assessment of relocation costs and alternative technologies, such as fiber.^{30/} As part of that evaluation, the Commission will be able to determine the timeline under which to make the spectrum available for wireless use. But it is contrary to the public interest to flatly reject potential wireless use of the spectrum and to assert now that all spectrum, in all locations, must be reserved for satellite use.^{31/} The Commission is required to manage spectrum in the public interest. In this case, the public interest requires the Commission to reallocate the 3.7-4.2 GHz band if the Commission finds that the spectrum is needed to meet 5G mid-band wireless needs and incumbent satellite operations can otherwise be accommodated. Similarly, asserting that relocation will be costly and time-consuming ignores Commission precedent and the public interest benefits of reallocating spectrum.^{32/}

^{27/} Comments of Google, GN Docket No. 18-122, at 2-3 (filed May 31, 2018).

^{28/} GeoLinks Comments at 3. *See also* CTIA Comments at 6.

^{29/} Verizon Comments at 2.

^{30/} *See, e.g., id.* at 3; Nokia Comments at 4; Comments of Comcast Corporation, GN Docket No. 18-122, at 14-16 (filed May 31, 2018).

^{31/} *See, e.g.,* Content Companies Comments at 4-7; Comments of Eastern Sky, LLC, GN Docket No. 18-122, at 1 (filed May 30, 2018).

^{32/} *See, e.g.,* Motorola Solutions, Inc. Comments at 1-2; Comments of NCTA – The Internet & Television Association, GN Docket No. 18-122, at 7 (filed May 31, 2018); Comments of Crawford Broadcasting Company, GN Docket No. 18-122, at 2 (filed May 31, 2018). *See also Amendment of Part 2 of the Commission’s Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, et al.*, 18 FCC Rcd 2223, ¶ 31 (2003) (“On balance, it is in the public interest to reallocate a portion of the 2 GHz MSS spectrum to support continuing growth of fixed and mobile services.”); *Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service*, 10 FCC Rcd 10540, ¶ 28 note

III. AVIATION OPERATIONS AT 4.2-4.4 GHZ NEED NOT FORECLOSE WIRELESS USE OF THE 3.7-4.2 GHZ BAND

T-Mobile supports the safe operation of wireless avionics intra-communications (“WAIC”) and radio altimeters in the 4.2-4.4 GHz band and efforts to ensure that they are not subject to harmful interference. But the use of WAIC and radio altimeters in an adjacent band need not foreclose mobile wireless use in the 3.7-4.2 GHz band. Contrary to arguments made by some commenters,^{33/} the Commission can still accommodate WAIC and radio altimeters use in the 4.2-4.4 GHz band while allowing mobile wireless use in the 3.7-4.2 GHz band. The Commission should work with other federal agencies to determine an appropriate technical framework to allow mobile use at 3.7-4.2 GHz without causing harmful interference to properly engineered adjacent aviation operations.^{34/} Based on NTIA’s Spectrum Use Report for the 4200-4400 MHz band, wireless use of the 3.7-4.2 GHz band is feasible with in-aircraft operations systems operating in the 4.2-4.4 GHz band. The Spectrum Use Report states that “radio altimeters operating in the 4200-4400 MHz band typically have a center frequency of 4300 MHz” and “the emission bandwidths for a large majority of the radio altimeters used on Federal aircraft range from 20 MHz to 170 MHz.”^{35/} T-Mobile supports adjacent band compatibility tests, as suggested by several commenters.^{36/}

30 (1995) (“There is ample precedent for our reallocation of spectrum in the public interest, even where such reallocation results in displacement of current users of the spectrum, and it is clear that we have broad discretion to do so.”).

^{33/} See, e.g., Comments of The Boeing Company, GN Docket No. 18-122, at 7 (filed May 31, 2018); Comments of Airlines for America, GN Docket No. 18-122, at 3 (filed May 31, 2018).

^{34/} Comments of T-Mobile, GN Docket No. 17-183, at 20-21 (filed Oct. 2, 2017).

^{35/} SPECTRUM USE REPORT 4200-4400 MHZ, NTIA (2015), https://www.ntia.doc.gov/files/ntia/publications/compendium/4200.00-4400.00_01DEC15.pdf.

^{36/} See, e.g., The Boeing Company Comments at 7; Comments of International Air Transport Association, GN Docket No. 18-122, at 1 (filed May 31, 2018); Comments of the Aerospace Industries Association, GN Docket No. 18-122, at 6 (filed May 31, 2018).

IV. CONCLUSION

T-Mobile appreciates the Commission's continued efforts to expand use of the 3.7-4.2 GHz band for wireless services. As T-Mobile has explained, the 3.7-4.2 GHz band will be critical to 5G networks. The Commission's Report and rulemaking proceeding should therefore evaluate the necessity of the band for wireless use, how the band will be cleared, how incumbent operations in the band will be relocated to other spectrum bands or alternative technologies, and the compatibility of wireless services with operations in adjacent bands.

Respectfully submitted,

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