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June 30, 2016

SUBMITTED ELECTRONICALLY VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, NW
Washington, DC 20554

Re: **Notice of *Ex Parte* Presentation**

GN Docket No. 14-177, Use of Spectrum Bands Above 24 GHz for Mobile Radio Services

Dear Ms. Dortch:

On June 16, 2016, John Hunter, Senior Director, Technology and Engineering Policy for T-Mobile US, Inc. (“T-Mobile”) and I spoke with Edward Smith, legal advisor to Chairman Wheeler, regarding the above-referenced proceeding. We noted T-Mobile’s strong support for the Commission’s efforts to make additional spectrum available in the millimeter wave bands for Fifth Generation (“5G”) wireless broadband technologies. However, we expressed concern that, in trying to address competing interests, the Commission’s apparent decision falls short of maximizing the opportunity to drive investment and leadership in 5G technology development and deployment. Accordingly, we urged the Commission to take a different approach on certain important issues from that announced in the Fact Sheet describing the draft Report and Order and Further Notice of Proposed Rulemaking (“FNPRM”) in this proceeding.^{1/}

Satellite Sharing

As noted below, the amount of spectrum being made available for new licensed users in the millimeter wave bands will be limited. T-Mobile has therefore urged the Commission, consistent with the framework outlined by CTIA, not to further constrain exclusive licensed access to the spectrum by further expanding access to the 28 and 37/39 GHz bands by satellite

^{1/} Fact Sheet: Spectrum Frontiers Proposal to Identify, Open Up Vast Amount for New High-Band Spectrum for Next Generation (5G) Wireless Broadband, Federal Communications Commission (rel. Jun. 23, 2016), http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0623/DOC-339990A1.pdf (“Fact Sheet”).

operators.^{2/} T-Mobile has supported an approach that allows satellite operations to continue and expand in the band while ensuring that terrestrial operators are able to aggressively deploy service, particularly in the major urban areas. It is critical that the Commission not undermine the utility of the terrestrial licensed spectrum by granting satellite operators extensive rights, particularly in the major markets, to deploy systems that will interfere with or add uncertainty to the terrestrial operations.

In particular, for 28 GHz, the Commission should continue to license satellite operations on a secondary basis only. There are no grounds for changing the current approach. Increased protection can be acquired through auction or the secondary market. Secondary sites should only be in areas with very low population density (0.1% of the license area population within a 200 meter coordination zone), should exclude areas that support transient populations (both as Verizon suggests),^{3/} and should use sharing methods that will limit the impact on terrestrial systems. There should be no spectrum access system or similar database-driven access to the band by satellite or other operations. The Commission should also impose limits on radiation towards the horizon. For 39 GHz, existing rules under the soft segmentation approach should continue to govern.

Importantly, the Commission should not impose aggregate power flux density (“PFD”) limits to protect reception by satellite space stations in the 28 GHz band. The record is clear that there will be no harmful impact from aggregate terrestrial operations.^{4/} As Ericsson points out, there would need to be 9.55 million end-user transmitters within the spot beam to impact satellite use.^{5/} As it further notes, terrestrial transmissions will be directional, and would not generally be pointed at the sky in any case.^{6/} There have been no credible submissions contradicting the Ericsson study. Accordingly, the Commission should address this issue in the upcoming Report and Order and not, as some suggest, consider the issue in the anticipated FNPRM.^{7/} By failing to act on this important issue now, the Commission will unnecessarily – based on the strength of the record – create uncertainty and potentially depress investment in millimeter wave band operations.

^{2/} See *CTIA Ex Parte*, GN Dkt. No. 14-177, *et al.* (filed May 20, 2016) (proposing a framework that would maintain primary status for terrestrial use of the 28 GHz and 37-40 GHz bands, while enabling existing FSS users some protections without elevating their existing allocation rights); *T-Mobile Ex Parte*, GN Dkt. No. 14-177, at 4 (filed May 17, 2106) (discussing CTIA framework for the 28 GHz band); *T-Mobile Ex Parte*, GN Dkt. No. 14-177, at 6-7 (filed June 20, 2106) (discussing satellite operations in the 28 and 37/39 GHz bands).

^{3/} See Letter from Carla Rath, Vice President, Wireless Policy Development, Verizon, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.*, at 2-3 (filed June 14, 2016).

^{4/} See Letter from Mark Racek, Sr. Director, Spectrum Policy, Ericsson, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed June 15, 2016).

^{5/} See *id.* at 8.

^{6/} See *id.* at 1-3, 7-8.

^{7/} See, e.g., *Lockheed Martin Ex Parte*, GN Dkt. No. 14-177, at 3 (filed June 24, 2106); *EchoStar Satellite Operating Corporation, et al.*, GN Docket No. 14-177, *et al.*, at 1 (filed June 27, 2016).

Nor should the Commission revisit the soft segmentation approach it previously adopted for the 39 GHz band. That plan was intended to encourage satellite interests to focus attention above 40 GHz, by adopting rules more favorable to satellite operations in that segment of the band, while anticipating terrestrial operations in the spectrum below 40 GHz. Until recently, the satellite industry has shown little interest in using this spectrum. Now, it proposes rules that would eliminate the soft segmentation structure in favor of greatly expanding satellite operations, to the detriment of terrestrial services, yet would maintain the structure with respect to the satellite focus in the 40-42 GHz band.^{8/} Accordingly, the Commission should not permit satellite use of the 39 GHz band with increased PFD limits absent a definitive determination that such use will not interfere with terrestrial operations. At a minimum, the Commission should maintain the current structure and only re-evaluate the soft segmentation approach if it can be conclusively determined that satellite operations will not constrain or negatively impact terrestrial use and in the context of a more complete review of the use of the entire band, including allowing terrestrial access to the 40-42.5 GHz band.

37-37.6 GHz Band

According to the Fact Sheet, the Commission would make the 37-37.6 GHz band available for licensing by rule.^{9/} T-Mobile strongly opposes this approach. T-Mobile appreciates the need to share with federal operations in the band, but accommodating federal systems need not result in a licensed-by-rule scheme. As the Commission is aware, the most successful spectrum auction in the Commission's history – for AWS-3 spectrum – involved frequencies in which federal users may in some cases continue to share with commercial providers.^{10/} Yet, the Commission was able to auction the AWS-3 spectrum with exclusively licensed spectrum. It should take the same approach here. A license-by-rule approach, in contrast, will effectively make this an unlicensed

^{8/} As noted below, while there were no active satellite licenses for use of the 39 GHz band prior to the Commission's Notice of Proposed Rulemaking, Boeing has now proposed a satellite system to use the band. See *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, Notice of Proposed Rulemaking, 30 FCC Rcd. 11878, ¶ 38 (2015) (“*NPRM*”) (noting that “[t]here are currently no non-Federal FSS authorizations or pending applications in [the 39 GHz band]”). The satellite industry has only discovered the “need” for these bands based on potential limits on its access to the spectrum. Similarly, applications for satellite use of the 28 GHz band have increased dramatically since the Commission issued the *NPRM*. As of September 4, 2015, there were 20 stations licensed for Earth-to-space transmissions on a secondary basis in the 28 GHz band and 19 pending applications for operation in the band. See *NPRM* ¶ 27 & n.66. Since the *NPRM* was released on October 23, 2015 – approximately 20 months ago – an additional 43 applications have been submitted for new station facilities in the 28 GHz band.

^{9/} Fact Sheet at 1.

^{10/} *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd. 4610, ¶222 (2014) (stating that “successful implementation of commercial services in the AWS-3 bands depends upon successful coordination and sharing with Federal users”); see also *The Federal Communications Commission and the National Telecommunications and Information Administration: Coordination Procedures in the 1695-1710 MHz and 1755-1780 MHz Bands*, Public Notice, 29 FCC Rcd. 8527, 8257 (rel. July 18, 2014) (“The joint nature of this *Public Notice* reflects intersecting jurisdictions of the Commission (commercial users) and NTIA (federal users) in these bands.”).

band under a yet to be determined approach to sharing. This approach is unnecessarily complicated, will introduce uncertainty that will greatly reduce interest in the band, will significantly reduce the amount of spectrum for licensed 5G services, and will result in limited use of the spectrum.^{11/}

While T-Mobile supports the Commission extending flexible use rights to existing licensees, the Commission must realize that a license-by-rule approach will unnecessarily restrict the amount of (currently unused) spectrum that will be available for licensed operations in the millimeter wave bands, potentially limiting the ability of new entrants to take advantage of the promise of 5G operations using millimeter wave spectrum. According to the Fact Sheet, exclusively licensed terrestrial operations will be permitted in the 28 GHz, 37.6-38.6 GHz and 38.6-40 GHz bands.^{12/} The 28 GHz and 38.6-40 GHz bands are already heavily licensed – in the 38.6-40 GHz band, for example, T-Mobile estimates that the Commission has available for licensing less than half of the nationwide MHz/Pops, primarily in rural areas, with about 35% of the MHz/Pops available in the top 30 Economic Areas. In the 28 GHz band, T-Mobile estimates that approximately 26% of the spectrum remains unlicensed on a MHz/Pops basis, with approximately 6% of the spectrum available in the top 60 Basic Trading Areas on a MHz/Pop basis. The 37-37.6 GHz band represents an opportunity to make unencumbered millimeter wave spectrum available to new band entrants. Designating that spectrum for a licensed-by-rule approach, however, would reduce the amount of spectrum available for auction by almost 40% – eliminating three 200 megahertz channels that could be auctioned and that would enhance competition among service providers.

The Fact Sheet further suggests that the Commission expects to impose an operability requirement across the entire 37-40 GHz band.^{13/} While T-Mobile generally supports an operability obligation across that spectrum, it is detrimental and unrealistic to include the 37-37.6 GHz band as part of the 37-40 GHz band while the Commission continues to contemplate how the band may be shared. Absent the details of a sharing framework – including the device requirements – including the 37-37.6 GHz portion in the operability requirement would delay equipment development and deployment across the entire 37-40 GHz band. Accordingly, the Commission should exclude the 37-37.6 GHz band from the operability rules unless the band is made available for exclusive licensing. If the Commission makes the spectrum available on a

^{11/} T-Mobile notes that the Open Technology Institute and Public Knowledge have decried the fact that the Commission will not use the same type of spectrum sharing system adopted for the 3.5 GHz band. *See* Letter from Michael Calabrese, Director, Wireless Future Project, Open Technology Institute, and Harold Feld, Senior Vice President, Public Knowledge, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed June 13, 2016). The sharing structure being implemented in the 3.5 GHz band is still unproven, and there has been no deployment under the approach as details are still being developed. The Commission should not replicate this unproven model in this important spectrum. Instead, if the Commission wishes to further consider such an approach, it should seek comment on using a band being considered in the FNPRM, which will provide an opportunity for further comment and study while ensuring that this valuable spectrum can be put to productive use as quickly and efficiently as possible.

^{12/} Fact Sheet at 1.

^{13/} Fact Sheet at 1.

licensed-by-rule basis, then the operability requirements should be limited to the 37.6-40 GHz band and phased in for the 37-37.6 GHz band.^{14/}

Licensed Spectrum Deficit

The Fact Sheet suggests that the Commission contemplates making the 64-71 GHz band available for unlicensed use.^{15/} That 7000 megahertz of spectrum, combined with the 600 megahertz at 37-37.6 GHz, will create 7600 megahertz of spectrum designated for unlicensed or essentially unlicensed use, as compared with the only 3250 megahertz of spectrum that the Commission would make available for exclusive licensed use. And because the 57-64 GHz band is already unlicensed, the imbalance is even greater – 14600 megahertz of spectrum available for unlicensed or essentially unlicensed use, with less than one quarter of that amount, only 3250 megahertz of spectrum, available for exclusive licensed services. The Commission should re-evaluate the division of spectrum between licensed and unlicensed use. Licensed operations are at the core of the 5G vision. The leadership that the Commission has demonstrated in making spectrum for 5G available will be undermined by missing this opportunity to make a portion of the 64-71 GHz band available for licensed use. Making spectrum available for licensed services in the 64-71 GHz band will provide the certainty necessary to promote the investment in equipment development and device innovation that will benefit users of both licensed and unlicensed segments of the band.

Spectrum Aggregation

The Fact Sheet states that the draft Report and Order contemplates an *ex ante* spectrum holdings limit of 1250 megahertz applied to auctioned spectrum in these bands, and a spectrum threshold of 1250 megahertz for case-by-case review of secondary market transactions.^{16/} T-Mobile strongly endorses the Commission’s efforts to prevent excessive spectrum aggregation in the millimeter wave bands and recently noted its support of the approach proposed by the Competitive Carriers Association (“CCA”).^{17/} CCA proposed that the Commission provide enhanced review for any acquisition of spectrum that would result in the licensee holding more

^{14/} At most, the 37-37.6 GHz band should only be included once sharing and technical rules are adopted for that spectrum and it is clear that operability requirements will not negatively impact device development or operation in the 37.6-40 GHz band.

^{15/} Fact Sheet at 1.

^{16/} Fact Sheet at 2.

^{17/} Letter from Steve B. Sharkey, Vice President, Government Affairs Technology and Engineering Policy, T-Mobile, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, at 2 (filed June 20, 2016); see Letter from Rebecca Murphy Thompson, EVP & General Counsel, Competitive Carriers Association, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed June 15, 2016) (“CCA *Ex Parte* Letter”). The Commission asked in the *NPRM* (1) whether it should adopt band-specific spectrum holding limits for the licensing of the millimeter wave bands, either for individual bands or a combination of the bands; and (2) whether it should include the millimeter wave bands in the spectrum screen currently applied to secondary market transactions. See *NPRM* ¶¶ 191-92.

than one-third of the available high-band spectrum or more than one-half of the high-band spectrum in a particular frequency band.^{18/}

That approach is superior to the plan that is apparently in the draft Report and Order. First, as noted above, there will only be 3250 megahertz of spectrum made available for exclusive licensed use in the millimeter wave bands – if the 37-37.6 GHz band falls under a licensed-by-rule approach, it should not be counted toward the amount of spectrum available for licensed use, particularly when the degree of sharing is not yet known. One third of 3250 megahertz is 1083 megahertz, not 1250. While T-Mobile agrees that the use of a one-third screen is appropriate and consistent with the Commission’s approach to spectrum aggregation in other bands, the trigger should more accurately reflect the amount of exclusively licensed spectrum actually available.

Second, merely adjusting the screen is insufficient. The Commission should adopt the two-tier approach that CCA and T-Mobile have recommended. A single screen suggests the spectrum is fungible. But that assumption may not be true. To the contrary, there are technical distinctions in the bands – notably an approximately 20% difference in propagation capacity – and it is not clear how this difference ultimately impacts the sustainability of the bands. In addition to technical differences, bands will have different sharing and other limitations, such as satellite earth station operations. Therefore, it is not reasonable at this time to assume that access to a particular millimeter wave band will be a substitute for access to all millimeter wave bands. Ensuring diversity of ownership in a band will facilitate competition and a healthy device ecosystem. A screen helps ensure that the competitive impacts of a transaction can be properly and fully evaluated under the totality of circumstances, including consideration of information available at the time regarding other available spectrum that might be considered substitutable. While the FNPRM will include consideration of numerous other bands, the outcome of that proceeding is not clear and the Commission should adopt a framework that helps ensure a diverse and competitive ecosystem in the limited resources being made available.

An in-band screen would also require the Commission to more thoroughly evaluate transactions where an entity proposes to acquire nearly the all the spectrum in a band – as Verizon might if it exercises its option to acquire XO’s 28 GHz spectrum.^{19/} Because, in the context of transactions, the limit would be used as a screen and not a cap, the Commission would be free to evaluate market conditions at the time of a transaction, including the substitutability of available millimeter wave bands.

^{18/} CCA *Ex Parte* Letter at 2.

^{19/} XO Holdings and Verizon Communications filed a series of applications to transfer various authorizations to Verizon, and Nextlink Wireless filed applications to lease its 28 GHz and 39 GHz authorizations to Verizon, which will provide Verizon with access to a substantial amount of spectrum. *See Consolidated Applications to Transfer Control of Domestic and International Section 214 Authorizations*, WC Docket No. 16-70 (filed Oct. 30, 2015); *Applications of Cellco Partnership Verizon Wireless and Nextlink Wireless, LLC*, Description of Transaction and Public Interest Statement, ULS File No. 0007162285 (explaining that under the terms of a purchase agreement, XO Holdings, the parent of Nextlink, granted Verizon the option to purchase all of Nextlink’s interests).

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Pursuant to Section 1.1206(b)(2) of the Commission's rules, an electronic copy of this letter is being filed for inclusion in the above-referenced docket and copy of this letter has been sent to Mr. Smith. Please direct any questions regarding this filing to the undersigned.

Respectfully submitted,

/s/ Steve B. Sharkey

Steve B. Sharkey
Vice President, Government Affairs
Technology and Engineering Policy

cc: (via e-mail)
Edward Smith