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Ex Parte

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

Re: Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122

Dear Ms. Dortch:

The cardinal policy objective of this proceeding is to clear a significant amount of C-Band spectrum for 5G – and to do so quickly – applying a sound transition mechanism that ensures current services using C-Band will continue to be delivered. The CBA-led transition plan will best achieve this objective. It will clear the spectrum must faster, with fewer risks and uncertainties, than the proposal to jettison satellite delivery and replace it with a forced conversion to a new delivery system. And concerns that the remaining C-Band spectrum may not accommodate future satellite-delivered 4K and Ultra HD content are misplaced, as compression technology and overall declining demand for C-Band traffic, as well as increasing reliance on fiber, will absorb such programming.

A Satellite Operator-Led Transition Remains the Fastest Way to Repurpose 3.7-4.2 GHz Spectrum While Ensuring that Content Distribution is Not Disrupted.

The transition plans submitted by CBA and the ACA Coalition involve starkly different timelines. ACA's plan would take twice as long to clear spectrum nationwide – and likely even longer. Any examination of the fundamentals of the two plans, moreover, shows the risks inherent in the ACA plan and its timeline for clearing.

1. CBA's Transition Proposal Clears Spectrum Far Sooner than The ACA Coalition's.

There is a compelling public interest in assessing how quickly alternative transition proposals will make spectrum available for 5G and considering the significant public benefits of a more timely deployment of 5G.¹ By that measure, CBA's proposal is clearly preferable to the ACA Coalition's. CBA targets a nationwide clearing of spectrum in half the time that ACA would – 3 years vs. 6

¹ See, e.g., Letter from Gregory M. Romano, Verizon to Marlene H. Dortch, FCC (filed Oct. 9, 2019) (explaining the significant economic benefits at stake and the negative impacts for the United States if C-Band repurposing is unnecessarily delayed) ("October 9, 2019 Verizon Letter"). All comments and letters cited in this letter are in GN Docket 18-122 unless otherwise noted.

years.² Plus, CBA commits to clear specific markets within 18 months, while ACA makes no such commitment.

CBA's current proposal commits to clear a first tranche of spectrum in 46 of the top 50 PEAs within 18 months of an FCC order, and clear the remaining spectrum in those 46 PEAs, and other spectrum nationwide, within 36 months.³ In contrast, ACA proposes that within years 2 and 6 after an FCC order, fiber will fully replace satellite delivery and some earth stations will operate on a lesser amount of spectrum, with no clear timeline for how much spectrum will be cleared at any point in time.⁴

In fact, the ACA Coalition's timeline devotes at least the full first year after the FCC order to developing a governance structure and negotiating among the numerous "programmers, MVPDs, service providers and other stakeholders."⁵ The actual fiber conversion does not even begin until at least Year 2 – the year when CBA targets completing the clearing process in 46 markets for 5G.⁶

And the ACA Coalition's plan will likely take longer. Verizon and other parties raised concerns that the ACA Coalition's timeline is unsupported by realistic inputs or assumptions.⁷ The national broadcast networks warn that the ACA Coalition plan could take "more than a decade."⁸

² See, e.g., Letter from Jennifer D. Hindin, Counsel to CBA to Marlene H. Dortch, FCC (filed Apr. 9, 2019) ("CBA Transition Implementation Process"); Letter from Brian Hurley to Marlene H. Dortch, FCC (filed Sept. 25, 2019) ("ACA Connects Supplement").

³ CBA Transition Implementation Process at 9.

⁴ See ACA Connects Supplement at 36. ACA asserts that spectrum will be cleared on a market-by-market basis, but provides no details on which markets would clear first or when. *Id.*

⁵ ACA Connects Supplement at 36.

⁶ The ACA Coalition offers a five-year timeline, but its own proposal states that the five year implementation period does not start until a full year after adoption of an FCC order, making it a six-year process. ACA Connects Supplement at 15.

⁷ See, e.g., Comments of Verizon at 14 (filed Aug. 7, 2019); Comments of NTCA – The Rural Broadband Association at 3 (filed Aug. 7, 2019); Comments of NAB at 5-6 (filed Aug. 7, 2019); Comments of Cumulus Media, Inc. and Westwood One, LLC at 2 (filed Aug. 7, 2019); Comments of LinkUp Communications Corp. at 2 (filed Aug. 3, 2019); Comments of North American Broadcasters Ass'n at 3 (filed Aug. 7, 2019); Comments of PSSI Global Services LLC at 2; Comments of QVC, Inc. and HSN, Inc. at 5 (filed Aug. 7, 2019).

⁸ Comments of the Content Companies at 9 (filed Aug. 7, 2019) ("Content Companies Second PN Comments").

Using data from a study by NERA, CBA demonstrates that ACA significantly underestimates the number of earth stations that are outside of but near to urban areas that will need to be replaced before repurposed spectrum in those urban areas can be used.⁹ And, particularly because the ACA Coalition’s plan diffuses responsibility for fiber deployment across an unlimited number of entities, the “learning curve” could slow deployments, further calling into question the timeline ACA envisions.

2. CBA’s Transition Proposal is Far More Credible than The ACA Coalition’s.

The FCC needs to weigh the CBA and ACA Coalition plans not only for how long they project to clear the spectrum, but also on the fundamentals of their transition plans and their projections. While the ACA Coalition’s ambitious goals related to fiber deployment may well be good candidates for a broader infrastructure plan, too much is at stake in this already complex proceeding to delay the availability of important mid-band spectrum for 5G to further those fiber-related goals. CBA’s plan is far more concrete and credible.

As an initial matter, executing on a transition plan as complicated as C-Band repurposing depends on expertise and familiarity with the content distribution market, satellite usage, and earth station operations that will be modified into the repacked portion of the C-Band.

The CBA can hit the ground running, because it has already done so much legwork. Key elements of the CBA repacking transition include regrooming of satellite services and installation of CBA-designed “5G rejection filters” at each earth station. CBA members routinely engage in regrooming, devising and performing customer-specific migration plans that address new transponder or satellite locations and the seamless timing of changeovers. CBA member companies have already “prepared customer-specific migration and sequencing plans that contain the proposed timing, frequency, and new transponder or satellite location for each customer.”¹⁰ And CBA has developed, built and tested filters, and executed RFPs with six implementation vendors.¹¹

⁹ CBA Second PN Comments at 10-11.

¹⁰ See CBA Transition Implementation Process at 4.

¹¹ *Id.*

The ACA Coalition plan calls for MVPDs to successfully negotiate and obtain – within the proposed timeframe – an indefeasible right of use to 300,000 route miles of fiber and requires 120,000 route miles of newly built fiber, including across vast rural areas of the nation.¹²

Verizon has gained extensive experience deploying fiber in localities across the country – today, we deploy approximately 1,400 fiber miles each month in 60 markets outside of our traditional wireline footprint. A plan as massive and ambitious as ACA’s presents complex issues only some of which ACA touches on cursorily. For example, it glosses over the literally hundreds of contracts that will need to be negotiated among earth stations, wireline transport providers, and fiber installers. Each fiber build is customized, and fiber providers and customers negotiate service level agreements that affect both the cost and design of the deployment. And there is no evidence that ACA’s timeline adequately accounts for these or the other gating factors that affect fiber deployment.

ACA also fails to grapple with other risks associated with such a widescale transition, such as the delay associated with local approvals to lay fiber. Even the Fiber Broadband Association significantly caveats its support of ACA Coalition’s projected time line by stating that the timeline may be feasible “assuming there are no other issues, including in accessing rights-of-way, poles and other infrastructure.”¹³ These issues are real; last year the Commission found that many localities had imposed moratoria preventing or significantly delaying deployments of fiber and other facilities needed to support communications services.¹⁴

Ultimately, achieving a timely transition depends on accountability. And the CBA is a single entity that would be accountable for repacking the band and achieving the timeline. In contrast, no single entity will be accountable for the fiber conversions and other work called for by the ACA Coalition’s plan, and the FCC will have little if any ability to control this process.¹⁵

¹² C-Band Clearing Plan at 8 (July 8, 2019), attached to letter from Pantelis Michalopoulos, Counsel to ACA Connects to Marlene H. Dortch, Secretary, FCC (filed July 9, 2019).

¹³ Letter from Lisa R. Youngers, Fiber Broadband Association to Marlene H. Dortch, FCC at 2 (filed Sept. 13, 2019). The Fiber Broadband Association also concludes that given a “current CAGR is 12%” for fiber deployments, a “7%” increase in fiber deployment over the estimates for 2019 is achievable. However, it is unclear whether that growth rate would cover all markets that will be affected by the fiber builds required the ACA’s Coalition’s proposal.

¹⁴ *Accelerating Wireline Broadband Deployment By Removing Barriers to Infrastructure Investment*, Third Report and Order and Declaratory Ruling, 33 FCC Rcd 7705 (2018).

¹⁵ The 800 MHz rebanding process is instructive; it was supposed to be a three-year project that has taken more than a decade and is not yet complete.

In short, under a satellite operator-led transition, the key players have the expertise and know-how, along with properly aligned incentives, to ensure content distribution services are not disrupted. That is not to say that fiber is irrelevant to content distribution. To the contrary, fiber is a growing alternative to existing C-Band delivery. But the ACA Coalition's plan assumes way too much for a mandated, total fiber conversion and involves too much uncertainty for the Commission and relevant stakeholders to embrace as the means to rapidly transition C-Band spectrum for 5G.

Untapped Compression Technology and Declining Demand for C-Band Delivered Content Distribution Will Absorb Capacity Needs Should 4K and Ultra HD Programming over Satellite Expand.

Some commenters suggest that, with the coming of 4K and Ultra HD video programming, the repacked portion of the C-Band should incorporate vacant spectrum reserved for the future capacity demand of these high resolution services,¹⁶ but the available facts do not support that concern. Instead, the Commission should analyze future 4K and Ultra HD capacity needs based on the following factors: available evidence on the demand for 4K and Ultra HD; investment in compression technology that reduces capacity need; and impact of the declining demand for satellite-delivered content that will continue to free up additional satellite capacity.

1. Ultra HD/4K Video Programming is Very Limited Today – Especially Via Satellite – and Stakeholders Offer No Evidence to Suggest a Significant Uptick.

Although the market uptake of 4K and Ultra HD television sets is significant, 4K and Ultra HD video programming – particularly delivered over C-Band satellites – lags significantly behind. And there is no expectation to suggest a change dramatically anytime soon.¹⁷

Last year it was reported that C-Band operator SES delivers 2,700 HD channels globally – the most of any provider – but only 50 Ultra HD channels (less than 2% of its total).¹⁸ Counting only commercially available services (not trials), the Ultra HD Forum estimated that “there were 51 active UHD services available around the world as of March [2018] – a figure that include[d] Netflix and

¹⁶ See, e.g., Comments of NCTA – The Internet & Television Association at 17 (filed Oct. 29, 2018); Comments of the Satellite Industry Association at 5 (filed May 31, 2018); Comments of the Content Companies at 4 (filed Oct. 29, 2018).

¹⁷ See, e.g., Will Strauss, *UHD and HDR: The Full Picture*, IBC (Aug. 9, 2018), (“The Full Picture”), <https://www.ibc.org/publish/uhd-and-hdr-the-full-picture/3044.article?adredir=1>

¹⁸ Chris Forrester, *SES Readies for Significant UHD Growth*, IBC (Sept. 14, 2018), <https://www.ibc.org/delivery/ses-readies-for-significant-uhd-growth/3230.article>.

Amazon.”¹⁹ Indeed, online streaming remains the biggest source of 4K content, led by Netflix and Amazon’s growing selection of original series.²⁰ The limited 4K programming delivered on linear TV is mainly sports.²¹

The evidence to date does not suggest this is likely to change dramatically any time soon. For example, in 2014, Intelsat commissioned a study to survey its media customers “on awareness of and plans for 4K UHD TV content[.]”²² The study indicated that 63% believed that “4K UHD TV [would] reach penetration on par with current HD rates within 5 to 7 years.” It’s been five years, and a review of traffic delivered on U.S. authorized C-Band CONUS satellites between 87° W.L. and 139° W.L. reveals that less than 0.5% of the approximately 2,000 channels are 4K or Ultra HD today.²³

1. Investment in Compression Technology will Enable More Efficient Delivery of Higher Resolution Video Content such as 4K and Ultra HD.

In the event that demand for satellite-delivered 4K or Ultra HD programming does expand, however, the video distribution ecosystem can address increased demand by upgrading to more up-to-date compression technologies to deliver such higher resolution programming.

Today, significant C-Band content distribution continues to be delivered using less efficient compression technology than what is available in the marketplace – namely, MPEG-4 format (developed in 1998) and even less efficient MPEG-2 format (developed in 1995). A review of traffic delivered on U.S. authorized C-Band CONUS satellites between 87° W.L. and 139° W.L. shows that

¹⁹ Alana Foster, *Satellite’s Role in Delivering UHD Content*, IBC (Oct. 12, 2018), <https://www.ibc.org/publish/satellites-role-in-delivering-uhd-content/3384.article>. Note that around this same period, the Ultra HD Forum was more conservative in its estimates. See *The Full Picture*.

²⁰ See, e.g., Joe Supan, *Where to Find 4K Content in 2019*, REVIEWS.COM (Apr. 12, 2019), <https://www.reviews.com/blog/where-to-find-4k-content-in-2019/> (noting that “[w]hen it comes to 4K TVs, the tech is still ahead of the content.” . . . “with nearly 600 titles, Netflix has the largest 4K streaming library by far” . . . and “[f]ew types of TV would benefit from 4K as much as live sports[,] but catching a game in 4K is still more of a novelty than the norm”).

²¹ See, e.g., Jeff Berman, *What’s Holding Back Broadcast 4K?*, HOME THEATER REVIEW (Mar. 25, 2019), <https://hometheaterreview.com/whats-holding-back-broadcast-4k/>

²² See *Global Survey of Media Executives Forecasts 4K Ultra High Definition TV Adoption and Business Models*, Intelsat (2014), http://www.intelsat.com/wp-content/uploads/2014/09/4K_Ultra_High_Definition_TV_Adoption_and_Business_Models.pdf.

²³ See TVROSat.com: Satellite Charts (last visited Oct. 18, 2019), https://www.tvrosat.com/cgi-bin/portal_charts.cgi.

more than 50% of channels continue to be delivered over MPEG-4 format and over 40% is delivered over MPEG-2 format.²⁴

A more up-to-date compression technology, the HEVC format (developed in 2003) has only recently entered the marketplace, but it can deliver the same subjective quality of video transmission as MPEG-4 using 59% less bandwidth, and using less than 25% of the bandwidth required for MPEG-2.²⁵ And a single transponder can deliver two to four HD channels using MPEG-2 compression, but that same transponder could deliver three to four Ultra HD channels using HEVC and broadcasting in DVB-S2.²⁶

Ultimately, the public interest in repurposing C-Band spectrum for fifth-generation wireless technologies that is expected to result in \$275 billion in network investment²⁷ should not be hamstrung by video programming and delivery interests content to rely on highly inefficient, decades-old technologies. And that is particularly the case as more fiber is deployed over time, as fiber is better suited for delivery of 4K or Ultra HD content than C-Band satellites.

2. Declining Demand for C-Band Content Distribution Further Frees Up Capacity.

Data in the record show that demand for C-Band content distribution is declining and this opens up even more C-Band capacity to the extent there is growth in satellite-delivered 4K or Ultra HD programming.

C-Band transponder equivalent demand is expected to decline by 26% between 2017 and 2026, resulting in a corresponding increase of available capacity on today's satellites.²⁸ As but one

²⁴ See TVROSat.com: Satellite Charts (last visited Oct. 18, 2019), https://www.tvrosat.com/cgi-bin/portal_charts.cgi.

²⁵ See, e.g., Peter B. de Selding, *New Technologies Pose Challenges for Sat Bandwidth Providers*, Space News (Jul. 7, 2014), <https://spacenews.com/41160satellite-telecom-new-technologies-pose-challenges-for-sat-bandwidth/> (“*New Technologies Pose Challenges*”).

²⁶ See *New Technologies Pose Challenges*.

²⁷ *Smart Cities: How 5G Can Help Municipalities Become Vibrant Smart Cities*, ACCENTURE STRATEGY, at 3 (2017), https://newsroom.accenture.com/content/1101/files/Accenture_5G-Municipalities-Become-Smart-Cities.pdf.

²⁸ See, e.g., Letter from Mark Racek, Ericsson to Marlene H. Dortch, FCC, GN Docket No. 17-183 (filed Mar. 29, 2018) (citing a report by Northern Sky Research (“NSR”).

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reflection of the C-Band marketplace, one study found a steady decline in contracts for satellite-delivered video content over a four-year period.²⁹

Meanwhile, some video providers are increasingly relying on fiber-based terrestrial connectivity as an alternative to C-Band distribution – including Verizon – thereby freeing up more C-Band capacity.³⁰ Video distributors should, however, continue to have flexibility to determine the technologies that best meet their needs going forward – whether continued use of C-Band or fiber or something else.

* * *

This filing is submitted pursuant to Section 1.1206 of the Commission’s rules.

Sincerely,

/s/

Gregory M. Romano

²⁹ Gagan Agrawal, *State of the Satellite Industry – The NSR FSS Index*, Northern Sky Research (Apr. 15, 2018), <https://www.nsr.com/state-of-the-satellite-industry-the-nsr-fss-index/> (noting that “[t]he decline in both video and non-video contracts is sharp and closely mirrors the price decline over the same period.”).

³⁰ *See, e.g.*, Letter from Joseph C. Cavender, CenturyLink to Marlene H. Dortch, FCC (filed Sept. 23, 2019).