Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	SB Docket No. 25-305
Facilitating More Intensive Use of Upper Microwave Spectrum	)	

To: The Commission

REPLY COMMENTS OF OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA AND PUBLIC KNOWLEDGE

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February 18, 2026

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The Open Technology Institute (OTI) and Public Knowledge (PK) hereby submit these reply comments in response to the Notice of Proposed Rulemaking in the proceeding noted above. Our groups once again urge the Commission to replace the current sharing framework in the millimeter Wave bands referenced in this proceeding with a light-licensing and automated database coordination approach that enables more cost-effective and intensive spectrum access, while more consistently protecting incumbent deployments from harmful interference.

I. INTRODUCTION AND SUMMARY

Our groups applaud the Commission for proposing to update the sharing framework that governs the millimeter wave bands shared between satellites and terrestrial UMFUS use. In order to facilitate more intensive and productive use of the mmWave UMFUS bands, the Commission should adopt the sort of two-step light licensing framework and automated coordination database that has successfully coordinated sharing in the 70/80/90 GHz bands for two decades. This more speedy, cost-effective, flexible and transparent framework would streamline the registration process, provide the NGSO satellite industry with the FSS gateway earth stations needed to backhaul the rapid growth in demand for advanced satellite services, protect the reasonable

expectations of terrestrial licensees to continue their very localized and mostly indoor capacity deployments, and generally promote an abundance of ubiquitous connectivity options.

First, our groups believe the record supports our view that consumers and the economy will benefit most if the Commission fully replaces the current very restrictive and cumbersome UMFUS bands sharing framework with a unified and at least semi-automated light-licensing coordination system that needed to expand backhaul for the exploding demand for next generation satellite services. We agree with satellite commenters that the two-step light-licensing and automated coordination process that successfully governs shared access to the 70/80/90 GHz bands is a feasible, fast and very cost-effective approach to coordinating FSS earth stations in UMFUS and other shared mmW bands (particularly Lower 37 GHz and 42-42.5 GHz).

Second, to cut through the chasm of contending positions in this docket, we explain why it is crucial to distinguish between spectrum that is most cost-effective for *wide area coverage* and mmWave spectrum that is useful primarily for adding *capacity* in targeted, high-density locations. Related closely to this is the distinction between terrestrial UMFUS deployments *indoors* (which are inherently shielded from weak satellite signals outdoors) and outdoors (which so far have been few). There is nothing in the record to suggest that in the foreseeable future—whether for terrestrial 5G or 6G—the mobile industry plans to rely on UMFUS bands for wide area coverage outdoors. To the contrary, terrestrial licensees describe deployments and use cases that are highly localized and focused on "high-use" venues that are mostly indoors or shielded. They even propose alternative buildout metrics premised on site-based (and mostly indoor) deployments rather than on wide area coverage. Nor is this likely to change as they advance to 6G. Almost all the applications cited as justifying major investments in a 6G mobile ecosystem will be used almost entirely indoors. And virtually every use case will be more cost-effective

operating on the additional 800 megahertz of mid-band, exclusive use spectrum mandated last year by Congress.

Finally, contrary to the claims of terrestrial licensees, reducing restrictions on the siting of FSS Earth Stations and employing a light-licensing coordination system does not represent a 'fundamental change' in how terrestrial licensees are currently using or likely to use these mmW bands. More plainly put, the proposed changes to the band-sharing framework would not "impair a licensee's ability to provide the same services as enabled by the original license." Even if satellite operators coordinate and receive first-in protections for hundreds of FSS earth stations, terrestrial licensees in the UMFUS bands will be able to continue using the band as they do now, which is to add capacity with very location-specific deployments that are mostly indoors or in a relatively isolated or controlled location (e.g., a stadium, or an industrial or college campus) that are a sufficient distance from where a FSS earth station would be sited.

II. THE RECORD SHOWS STRONG SUPPORT FOR REPLACING OUTDATED SECTION 25.136 RESTRICTIONS WITH A UNIFIED LIGHT-LICENSING FRAMEWORK THAT PROMOTES. SPECTRUM ABUNDANCE AND NEXT GENERATION SATELLITE SERVICES.

In the comments that OTI and PK filed in this proceeding, our groups urged the Commission to fully replace the outdated Section 25.136 restrictions and cumbersome manual coordination process with "a two-step light-licensing and automated database coordination approach to spectrum sharing that enables more rapid and cost-effective spectrum access while providing more consistent and transparent protection for band incumbents."[1] Although the record

[1] Comments of Open Technology Institute at New America and Public Knowledge, *Facilitating More Intensive Use of Upper Microwave Spectrum*, Notice of Proposed Rulemaking, SB Docket No. 25-305, at 2 (Jan. 20, 2026) ("Comments of OTI & PK"). All comments cited hereinafter refer to this docket and filing date unless otherwise specified.

shows a clear divergence between mobile and satellite industry stakeholders, we believe the record supports our view that consumers and the economy will benefit most if the Commission replaces the current very restrictive and cumbersome sharing framework with a unified and at least semi-automated light-licensing coordination system that promotes more timely and cost-effective access to the UMFUS bands to meet the need to backhaul the exploding demand for next generation satellite services.

It is crucial to realize that FSS earth station gateways are hubs for middle-mile transport– the equivalent of fiber in the sky, which requires an enormous amount of spectrum in an environment that is rapidly getting more crowded with enormously more advanced, very high-capacity satellites. Accordingly, the leading U.S.-licensed satellite operators support expanding and streamlining access for FSS earth stations, including the condition that all existing terrestrial deployments be fully protected from an undue risk of harmful interference. Amazon Leo urges the Commission to "replace Section 25.136's complex technical criteria and manual coordination requirements with a streamlined automated database system."[2] Our groups agree with Amazon that by mirroring the successful link-registration system used to coordinate sharing of the 70/80/90 GHz bands, the Commission can "dramatically reduce processing times by automating the initial interference analysis that currently requires manual calculations and extensive documentation, while providing greater transparency to both FSS and UMFUS operators about the spectrum environment through a unified database of terrestrial and satellite deployments."[3]

[2] Comments of Amazon Leo at 6.

[3] *Id*.

Likewise, we agree with SpaceX that a light-licensing framework for all terrestrial and satellite sharing across the UMFUS bands "is simple, effective, and ready-to-deploy."[4] Like the two-step light-licensing and automated coordination process that successfully governs shared access to the 70/80/90 GHz bands, "the propagation characteristics of the Upper Microwave bands—including high-gain, narrow, directional beams, and a high sensitivity to atmospheric attenuation and obstructions–lead to small coordination zones that permit satellite and terrestrial deployments to coexist in close physical proximity with minimal risk of interference."[5]

Other satellite providers filed in support of updating the UMFUS band sharing framework to account for the surging demand for satellite data services and backhaul. A leading example of the innovation and surging demand for satellite data backhaul is Logos, a start-up the Commission approved earlier this month to deploy a constellation of up to 4,178 satellites in LEO. Logos supports a "comprehensive, automated coordination database" that supports "machine-to-machine access, allowing real-time updates and programmatic registration, with all database entries containing detailed technical information required for accurate interference analysis—such as antenna beamwidth, EIRP, and operational status."[6]

Similarly, the Commercial Space Federation ("CSF"), on behalf of its members, correctly observes that meeting future demand for next generation space-based services will "require robust, reliable backhaul using millimeter-wave spectrum across Ka-, V-, E-, and W-bands and the ability to rapidly deploy to meet accelerating and evolving demand."[7] CSF observes that contrary to expectations a decade ago, UMFUS bands are not serving as 5G terrestrial coverage

[4] Comments of Space Exploration Holdings LLC at 3 ("SpaceX").
[5] *Id.*
[6] Comments of Logos Space Services Inc. at 6.
[7] Comments of Commercial Space Federation at 2-3.

bands and, except possibly for 28 GHz, "little to no evidence exists of any meaningful terrestrial deployment or any credible plans to meet deployment obligations for the UMFUS bands." Accordingly, CSF "supports the Commission's proposal to adopt a 'light licensing' framework across all UMFUS bands" similar to the two-step coordination approach successfully used for two decades in the 70/80/90 GHz bands.[8] Eutelsat likewise supports the "light licensing" approach proposed in the NPRM.[9]

We further agree with Amazon and SpaceX that in anticipation of locations where automated coordination fails (i.e., a licensee receives a "yellow light" or "red light"), making manual coordination necessary, the Commission should adopt an "accelerated dispute resolution process" for situations "when coordination attempts result in an impasse or involve clear indications of delay or bad faith."[10] SpaceX suggests that when the automated interference analysis cannot yield a "green light" at a particular location, parties can "follow the same dispute resolution procedures used under the 70/80/90 GHz light-licensing framework before raising the issue with the Commission."[11] We agree that this is a proven process that conserves FCC resources and that—combined with a good faith coordination requirement—should operate to minimize both coordination delays and anti-competitive blocking behavior.

[8] *Id*. at 2. *See also* Comments of Computer and Communications Industry Association (CCIA) at 2 ("remove the existing §25.136 and replace it with a coordination-based approach focused on managing co-existence with the existing UMFUS users").

[9] Comments of Eutelsat at 3 ("A portal such as the one used for the 70/80/90 GHz bands could be used to facilitate this process").

[10] Comments of Amazon Leo at 8-9.

[11] Comments of SpaceX at 5.

III. A LIGHT-LICENSING FRAMEWORK TO COORDINATE SHARED TERRESTRIAL AND SATELLITE USE ACROSS THE UMFUS BANDS IS CONSISTENT WITH FCC AUTHORITY AND IS NOT A FUNDAMENTAL CHANGE OR BURDEN FOR TERRESTRIAL LICENSEES.

The comments of the satellite industry stakeholders noted in the section above all echoed and reinforced the NPRM's observations that the "UMFUS bands have not turned out to be core terrestrial wireless spectrum," that "[w]ireless operators have struggled with the short range and poor penetration of signals in the UMFUS bands," and that "there has been less emphasis on incorporating upper microwave spectrum into 5G networks than the Commission anticipated."[12] Similarly, our comments noted that 5G remains mainly confined to low- and mid-band spectrum with propagation characteristics that make it far more cost-effective to deploy and maintain. The relatively few 5G mmWave deployments to date are limited primarily to heavily-trafficked (and mostly indoor) venues such as stadiums, airports and dense urban malls (e.g., Times Square).[13] As a result, as the *NPRM* acknowledges, mobile carriers are returning licenses or well on their way to failing to meet buildout requirements. In contrast, satellite operators are flocking to mmWave spectrum with applications for FSS earth stations that have surged almost fourfold over the last 5-year period.[14]

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[12] *Facilitating More Intensive Use of Upper Microwave Spectrum*, Notice of Proposed Rulemaking, SB Docket No. 25-305, at ¶ 13 (rel. Oct. 29, 2025).

[13] *See, e.g.*, Roger Entner, "5G at the five-year mark: weak on vision, strong on execution," *Light Reading* (January 13, 2026), https://www.lightreading.com/5g/5g-at-the-five-year-mark-weak-on-vision-strong-on-execution. "Network quality from mid-band spectrum is real and measurable. Meanwhile, mmWave collapsed with no discernible consumer impact. . . . mmWave remains confined to stadiums and dense urban hotspots. It never became the transformative technology its advocates promised." *Id.*

[14] *Facilitating More Intensive Use of Upper Microwave Spectrum*, Notice of Proposed Rulemaking, SB Docket No. 25-305, at ¶ 14 (rel. Oct. 29, 2025).

And yet mobile industry stakeholders insist that the permissible sites for earth station gateways in these mmW bands must remain remote and severely restricted because of what they call "investment backed expectations." To cut through this chasm of contending positions, we believe it is crucial that the Commission distinguish between spectrum useful for *wide area coverage* and spectrum that can be cost-effective for adding *capacity* in very high-density locations. Related closely to this is the distinction between terrestrial UMFUS deployments *indoors* (which are inherently shielded from weak satellite signals outdoors) and outdoors (which so far have been few). Further, both of these distinctions should be viewed in the context of both the steadily declining growth of mobile data demand and a policy development last year that was unforeseen when the UMFUS band's sharing rules were crafted nearly a decade ago: *viz.*, that Congress would mandate the allocation of an additional 800 megahertz of far more valuable mid-band spectrum at full power for terrestrial mobile use.

We look closer at a few of these distinguishing factors in relation to whether expanding and streamlining the ability of next generation satellite services to site backhaul facilities would really change much of anything that the terrestrial mobile licensees are doing with UMFUS mmW spectrum today.

A. There is No Reasonable Expectation that Terrestrial Licensees Currently Rely or Will Rely on UMFUS mmW Bands for Wide Area Coverage Outdoors

First, there is nothing in the record to suggest that in the foreseeable future—whether for terrestrial 5G or 6G deployments—the mobile industry plans to rely on UMFUS bands for wide area coverage outdoors. Indeed, to the contrary, the record shows that in an effort to describe some practical use of these bands, the nationwide mobile carriers emphasize use in targeted venues that are mostly indoors. Here is how AT&T describes its handful of site-based deployments to date: "AT&T has deployed mmWave nodes in well over 100 stadiums, arenas,

airports, and similar venues across the country and expects to expand those venue-based deployments."[15]

Verizon, the only carrier that has deployed much of anything, describes its "intensive use" of UMFUS spectrum primarily in terms of highly-localized deployments in high-density venues and some campus-like settings: "Verizon's 5G Ultra Wideband network . . . has deployed tens of thousands mmW cell sites across the country, including deployments at airports, convention centers, schools, stadiums, health care facilities, multiple-dwelling units, and military bases."[16] While this is almost identical to how smaller operators and enterprises deploy private 5G/LTE networks using CBRS and 6 GHz unlicensed spectrum, it is nothing like Verizon's wide area outdoor deployments in low- and mid-band exclusive-use spectrum that depend far more on contiguous access over large areas to meet consumer expectations. And although Verizon also "uses UMFUS spectrum to serve signature civic and commercial destinations" such as the National Mall, Times Square and the New Orleans' French Quarter, it seems highly unlikely that a satellite operator would even consider locating an ES gateway in these locations, or could get a permit to do so. And given the propagation of mmW spectrum and urban clutter, even an Earth Station a kilometer away would be extremely unlikely to cause harmful inference.

Second, almost all the applications typically cited as justifying major investments in a future 6G mobile ecosystem will be used almost entirely indoors and not "on the go" outdoors. The 6G 'visions' emerging from mobile industry associations and equipment manufacturers most commonly cite very high-capacity and low-latency applications such as virtual reality, telepresence, robotics, holographic displays, immersive gaming, and AI-run factories and homes

[15] Comments of AT&T at 12.

[16] Comments of Verizon at 10-11.

– all of which will be used almost entirely indoors.[17] And while UMFUS bands may continue to be useful in adding capacity to terrestrial networks in very high-density indoor and relatively isolated venues (e.g., airports, stadiums, industrial and college campuses), mmW propagation should protect them in the vast majority of real-life scenarios from harmful interference from satellite Earth Stations operating entirely outdoors.

Third, the rate of growth in mobile data consumption is steadily declining, suggesting that aside from crowded venues during peak times, future demand by consumers for mobile data *outdoors* is unlikely to require or rely on the mmW UMFUS bands. Again, this will be particularly true as the 800 megahertz of additional mid-band spectrum mandated by Congress last year becomes available. The flattening growth in mobile data consumption is a global trend explained in large part by consumers reaching "peak video"; that is, there are only so many hours users will watch video on the go. Ericsson's annual mobility report shows that year-over-year mobile data growth declined globally from 80 percent in 2019 to 20 percent in 2025, with "video traffic expected to account for 76 percent of all mobile data traffic."[18] An analysis by Cisco, which strips fixed wireless data consumption from Ericsson's overall tally, concludes that the growth rate for mobile data in North America is closer to 11%.[19] Former Ofcom official William Webb and Dennis Roberson, longtime chairman of the FCC's Technical Advisory Committee,

[17] *See* Preston Marshall, *Evolving to 6G: The Case for a New Approach to 6G and Beyond*, Amazon Publishing (May 2024), at 95 ("Cellular technology dominates outdoors, but wireless is dominated by indoor usage. The proposed needs for 5G and 6G technology are mostly indoor applications.").

[18] Ericsson Mobility Report, at 12 (Nov. 2025), https://www.ericsson.com/en/reports-and-papers/mobility-report.

[19] Mark Grayson, "Wi-Fi and Open Roaming," Cisco presentation to Wireless Broadband Assn, Wireless Global Congress (Jan. 2025), https://www.youtube.com/watch?v=Hbdf7gbcxyw.

used CTIA mobile growth data to predict that mobile data consumption will touch down close to zero percent growth by 2029.[20]

In short, it's speculative at best to suggest that future very high-capacity 6G applications (expected after 2030) will make it necessary or economic to leverage UMFUS bands for outdoor wide area coverage. Even if satellite operators coordinate into hundreds of additional sites over the next five or more years, terrestrial licensees in the UMFUS bands will be able to continue using the band as they do now, which is to add capacity with very location-specific deployments that are mostly indoors, at relatively isolated or controlled locations that are a sufficient distance from where a FSS earth station would be sited.

B. Reducing Restrictions on the Siting of FSS Earth Stations and Employing a Light-Licensing Coordination System Does Not Represent a 'Fundamental Change' in these Shared UMFUS Bands

A major point of disagreement in the record is whether the Commission has the authority to change the restrictions and process that govern shared terrestrial and satellite use of the band. AT&T makes this argument most directly, asserting that "[p]roposals to expand FSS rights in mmWave bands by adopting the 'light licensing' proposal or reducing UMFUS licensees' protections under § 25.136 in favor of earth station siting would also exceed the Commission's authority to modify licenses under Section 316 of the Communications Act."[21] However, as AT&T concedes, only a "fundamental change" that hobbles a licensee's ability to continue providing the service it is providing limits the Commission's authority. That is clearly not the case here in UMFUS bands long authorized for sharing among satellite and terrestrial licensees.

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[20] Dennis Roberson and William Webb, *The End of Telecoms History* (2nd edition, 2025), at 133-134.

[21] Comments of AT&T at 14, citing *MCI Telecommunications Corp. v. AT&T*, 512 U.S. 218, 225 (1994). *See also* Comments of CTIA at 3 ("broad changes to the existing UMFUS sharing framework, . . . would amount to a fundamental change of the UMFUS licenses.").

Section 316 gives the Commission broad authority to modify licenses "if in the judgment of the Commission such action will promote the public interest, convenience, and necessity."[22] As the Commission concluded in its *2020 C-Band R&O*, it has ample precedent and authority to consolidate an incumbent service—voluntarily or involuntarily—into a smaller portion of a band (as it did with FSS in 2020), to rearrange licensees within a band, to modify operating rules, or even to move an incumbent to a different band.[23] However, the Commission cannot simply terminate an ongoing incumbent service, or even make a modification that amounts to a "fundamental change" to a licensee's ability to continue its service.[24] On the other hand, "courts have repeatedly found that if a licensee can continue to provide substantially the same service, a modification to that license is not a fundamental change."[25] Accordingly, in its *2020 C-Band R&O* the Commission found that "the upper 200 megahertz of spectrum we are reserving for future FSS operations is sufficient to continue the services . . .."[26]

As the previous section explained, the Commission's proposal to reduce the restrictions on the siting of FSS earth stations, whether or not a streamlined "light licensing" process replaces manual coordination, would not represent a fundamental change in how terrestrial licensees are currently using or likely using these mmW bands. More plainly put, the proposed changes to the band-sharing framework would not "impair a licensee's ability to provide the

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[22] 47 U.S.C. § 316. *See also California Metro Mobile Commc'ns, Inc. v. FCC*, 365 F.3d 38, 45 (D.C. Cir. 2004) ("Section 316 grants the Commission broad power to modify licenses.").

[23] *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, GN Docket No. 18-122, Report and Order and Order of Proposed Modification, 35 FCC Rcd 2343, at ¶¶ 111, 126-127 (2020) (*2020 C-Band R&O*).

[24] *See 2020 C-Band R&O* at ¶ 129; *MCI Telecommunications Corp. v. AT&T*, 512 U.S. 218, 228 (1994) (holding that statutory "authority to 'modify' does not contemplate fundamental changes").

[25] *Id*. at ¶ 129.

[26] *Id*. at ¶ 130.

same services as enabled by the original license."[27] As we explained above, even if satellite operators coordinate into hundreds of additional sites over the next five or more years, terrestrial licensees in the UMFUS bands will be able to continue using the band as they do now, which is to add capacity with very location-specific deployments that are mostly indoors or in a relatively isolated or controlled location (e.g., an industrial or college campus) that is a sufficient distance from where a FSS earth station would be sited.

Importantly, the Commission must consider that the UMFUS bands are *shared* bands, not so-called "exclusive use" bands allocated to optimize a contiguous wide area terrestrial mobile service (e.g., the lower C-band spectrum at 3700-3980 MHz). The only reasonable expectation that AT&T and other mobile licensees have is *exclusive terrestrial rights*. As Amazon correctly observed: "even under light licensing, the UMFUS licensee would remain the exclusive terrestrial licensee in its respective license area."[28] Terrestrial licensees have always expected that co-primary (and, at 28 GHz, secondary) satellite operators would be siting FSS earth stations and that the Commission's restrictions in this respect are never set in stone. Even if the future coordination of a FSS earth station into unused UMFUS spectrum impedes the ability of a terrestrial licensee to locate a base station in what it considers an optimal location, that is a minor and likely fairly rare burden to bear in shared mmW bands, particularly those where FSS is co-primary.

Accordingly, our groups agree with the satellite stakeholders, including Amazon, which states that "[t]he UMFUS band service rules contemplated sharing with satellite operations from

[27] *See MCI Telecommunications Corp. v. AT&T,* at 14, citing *Community Television, Inc. v. FCC,* 216 F.3d 1133, 1140–41 (D.C. Cir. 2000)

[28] Comments of Amazon Leo at 12.

the outset, which is why the current UMFUS-FSS sharing framework exists in the first place."[29] UMFUS is not the first terrestrial service the Commission has authorized as an additional shared user of these satellite bands. As the Commercial Space Federation reminds us: "Unfortunately, many of these co-primary millimeter-wave spectrum bands remain severely encumbered by legacy coordination and siting rules designed to advantage a speculative millimeter-wave '5G' service that—like its predecessor Local Multipoint Distribution Service (LMDS)—largely failed to materialize."[30]

We also agree with Amazon, SpaceX and others that because the Commission always intended to fashion rules for sharing that best serve the public interest, "the obligation to share the spectrum should not upend any reasonable expectation of terrestrial licensees, nor should the Commission's proposal to streamline and modify the rules governing such sharing."[31] SpaceX continues to note that light licensing "would continue to protect earlier-in-time operations from harmful interference, but via automated interference checks and efficient self-coordination rather than complex, cumbersome, and arbitrary keep-outs and site caps."[32]

And, of course, in these mmW bands deployments in venues and other heavily-trafficked indoor spaces will be completely unaffected by even a very nearby FSS earth station. SpaceX and other commenters also correctly point out that even with respect to outdoor terrestrial deployments, "[t]errain, buildings, and other obstructions further limit the risk of harmful interference."[33] For

[29] *Id*. at 11. See, e.g., Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al., GN Docket No. 14-177, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, ¶ 45 (2016) (noting that "[t]he record demonstrates that FSS earth stations in the 28 GHz band can share the band with minimal impact on terrestrial operations").

[30] Comments of Commercial Space Federation at 1.

[31] Comments of Amazon Leo at 11.

[32] Comments of SpaceX at 7.

[33] *Id*.

example, one of the mobile industry's leading examples of a current use for UMFUS spectrum is an open air football stadium or very heavily-trafficked public space like Times Square. Even if a FSS earth station was located close by, in the mmW bands above 28 GHz the propagation loss due to the stadium's walls, urban clutter and other factors would minimize the risk of actual harmful interference. Moreover, as suggested above, the Commission can also fashion a good faith coordination requirement that requires both parties to make reasonable adjustments to minimize interference.

Finally, it's worth noting that Verizon itself reinforces the conclusion that fully replacing the Section 25.136 restrictions and manual coordination process with a light-licensing and automated database coordination approach would not impose a "fundamental change" on terrestrial licensees by asking for alternative buildout requirements based on "high-use" (and primarily indoor or shielded) locations. After explaining why the wide area population coverage metrics that define buildout requirements in low- and mid-band spectrum are a mismatch with the "attributes of mmW spectrum,"[34] Verizon proposes that instead "an UMFUS buildout requirement alternative should be based on provision of service to a minimum number of 'high-use' locations in the licensed area."[35] Verizon then states that because "mmW bands efficiently target locations that demand high speeds and capacity," this alternative buildout requirement could replace coverage metrics with some number of locations from categories that "could include stadiums, hospitals, college campuses, corporate campuses, manufacturing facilities,

[34] Comments of Verizon at 20-21.

[35] *Id*. at 22.

military bases, data centers, and other locations where the licensee demonstrates high-intensity use on its network."[36]

Verizon's proposal to move the buildout goal posts to account for how it is actually using UMFUS mmW spectrum to meet customer needs is entirely reasonable. The Commission could consider incorporating this fundamental change in terrestrial carrier licensing obligations in the new sharing framework proposed in the NPRM, but should only do so as part of a more truly co-primary first-in-time and streamlined coordination framework. Coupled with requirements that satellite operators must protect all existing terrestrial deployments, but going forward can coordinate FSS earth stations at any or most locations that will not result in harmful interference, both services would be unshackled to make full use of these bands on a shared basis. Alternatively, if the FCC decided not to give future FSS earth station first-in-time rights to coordinate into every location, Verizon's proposal suggests that the Commission should at a minimum allow FSS earth stations to coordinate into any location that lies outside a specified separation distance (e.g., protection contour) from a specific list of such "high-use" locations (e.g., stadiums, college campuses, factory complexes).

[36] *Id*. Verizon's proposal for alternative buildout metrics are not surprising, since the record shows that if VZ meets its buildout requirements in most UMFUS band markets, including in 28 GHz, it may be primarily thanks to internal telemetry links that don't actually provide services to customers. The Commercial Space Federation explains that "public records reveal that tens of thousands of these UMFUS deployments appear to be mere internal 'telemetry' links—some just three feet long—that provide zero service to consumers, but for which UMFUS licensees claim coverage credit for 47,000 people each." Comments of CFS at 2.

IV. CONCLUSION

In order to facilitate more intensive and productive use of the mmWave UMFUS bands and meet the escalating need to backhaul next generation satellite services, the Commission should adopt the two-step light licensing framework and automated coordination database that is already successfully employed in the 70/80/90 GHz bands. This more speedy, cost-effective and flexible framework will streamline the registration process, provide the NGSO satellite industry with the FSS gateway earth stations needed to support flourishing growth in demand, protect the reasonable expectations of terrestrial licensees to continue their very localized and mostly indoor capacity deployments, and ensure all vacant spectrum is made available to ensure an abundance of ubiquitous connectivity options.

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