Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz	)	
For Mobile Radio Services	)	GN Docket No. 14-177
	)	
Establishing a More Flexible Framework to	)	
Facilitate Satellite Operations in the	)	
27.5-28.35 GHz and 37.5-40 GHz Bands	)	IB Docket No. 15-256
	)	
Amendment of Parts 1, 22, 24, 27, 74, 80, 90,	)	
95, and 101 To Establish Uniform License	)	
Renewal, Discontinuance of Operation, and	)	
Geographic Partitioning and Spectrum	)	
Disaggregation Rules and Policies for Certain	)	
Wireless Radio Services	)	WT Docket No. 10-112
	)	
Allocation and Designation of Spectrum for	)	
Fixed-Satellite Services in the 37.5-38.5 GHz,	)	
40.5-41.5 GHz and 48.2-50.2 GHz Frequency	)	
Bands; Allocation of Spectrum to Upgrade	)	
Fixed and Mobile Allocations in the	)	
40.5-42.5 GHz Frequency Band; Allocation of	)	
Spectrum in the 46.9-47.0 GHz Frequency	)	
Band for Wireless Services; and Allocation of	)	
Spectrum in the 37.0- 38.0 GHz and 40.0-40.5	)	
GHz for Government Operations	)	IB Docket No. 97-95

OPPOSITION TO PETITIONS FOR RECONSIDERATION

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TABLE OF CONTENTS

I. Introduction

Public Knowledge and Open Technology Institute at New America ("PK and OTI") submit this Opposition to the Petitions for Reconsideration regarding the Commission's 2016 Spectrum Frontiers Order.[1] Specifically, PK and OTI oppose efforts to reverse the allocation of 37-37.6 GHz band for non-exclusive shared access, the operability requirement across the entire 37-40 GHz band, the allocation for unlicensed spectrum in the 64-71 GHz band, and the cybersecurity disclosure rules adopted in the Report & Order. The Commission developed a balanced set of rules to govern the first batch of spectrum being dedicated to 5G technologies, with appropriate allocations for licensed, shared, and unlicensed use, with appropriate protections for federal users and incumbents. The Commission also adequately addressed its public interest obligations to protect consumers and the nation's communications infrastructure, by continuing to seek information regarding cybersecurity practices. The Commission's actions on these issues best serve the public interest, and the agency should not turn away from these strong policies. To the extent any of the Petitions fail to satisfy the requirements of the Commission's rules for Petitions for Reconsideration by attempting to relitigate or revisit issues already resolved by the Commission.[2]

II. The Commission Must Dismiss Attempts to Revive Arguments Already Addressed by the Commission, as Improper Subjects of a Petition for Reconsideration.

Petitioners fail to raise new arguments regarding sharing in the 37-37.6 GHz band, operability across the 37-40 GHz bands, and the allocation of unlicensed spectrum in the 64-71

[1] 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,* FCC 16-89 (July 14, 2016) ("Report & Order").
[2] *See generally* 47 CFR 1.429(b).
[3] *See generally* 47 CFR 1.429(b).
[4] 47 CFR 1.429(l)(3).
[5] *See* 47 CFR 1.429(b).
[6] *Id*.

GHz band. The arguments and facts raised in the Petitions are not new, and were directly addressed by the Commission already in the *Report and Order*.[3] The Commission's rules provide that Petitions for Reconsideration that "rely on arguments that have been fully considered and rejected by the Commission within the same proceeding" may be dismissed by the Commission or its bureaus because they "plainly do not warrant consideration by the Commission."[4] Furthermore, Petitioners fail to state any new facts or arguments which would entitle Petitioners to consideration under the Section 1.429(b).[5] Accordingly, the Commission should summarily dismiss those Petitions which are defective as they do not properly present issues eligible for Commission reconsideration, and are instead merely attempts to revisit and recycle issues that have been thoroughly considered and resolved in the Commission's July 2016 *Report & Order*.

III. The Record Supports the Commission's Decision to Allocate the 37 – 37.6 GHz Lower Band Segment for Dynamic Sharing with Federal Users on a License-by-Rule Basis.

The Commission's unanimous (5-0) decision to allocate a fraction of the 3,850 megahertz of licensed spectrum in the 28 and 37–40 GHz bands for non-exclusive sharing with Federal users reflects a well-grounded balancing of the views and interests expressed by a wide variety of stakeholders in the record. PK and OTI strongly support the framework adopted in the *Report & Order*, with shared access to the 37–37.6 GHz band authorized on a license-by-rule basis and available to both Federal and non-Federal users on a coordinated, co-equal basis.

Our groups agree with the Commission's conclusion that "[a]llowing part of the band to be made available on a non-exclusive, shared basis will promote access to spectrum by a wide variety of entities, support innovative uses of the band, and help ensure that spectrum is widely

[3] *Report & Order* at ¶ 112.
[4] 47 CFR 1.429(l)(3).

utilized."[6] Uniform exclusive licensing over large geographic areas across the entire 37–39 GHz band would not allow the largest possible number of businesses and individuals the opportunity to self-provision capacity for mobile data offload, the emerging Internet of Things, customized network solutions, and other connectivity needs. Since wireless carriers are likely to use spectrum at 37–40 GHz to enhance network capacity only in heavily-trafficked areas, limiting access to exclusive, wide-area and expensive licenses tailor-made for national carriers would also inevitably result in leaving most millimeter wave ("mmW") spectrum unused for many years, and perhaps permanently, in small town, rural, and other low-density environments outside of central urban areas and other high-traffic venues.

Accordingly, PK and OTI oppose the Petitions for Reconsideration filed by CTIA, T-Mobile, CCA, TIA and 5G Americas ("Petitioners"), each of which do nothing more than rehash their previous arguments for exclusive geographic-area licensing across the entire 37-40 GHz band, a one-size-fits-all outcome the Commission rejected in the *Report & Order*. Petitioners' rationale for re-litigating the Commission's well-considered decision boils down to several recycled arguments that are as unpersuasive as they were in Petitioners' previous comments and *ex parte* filings.

First, several Petitioners assert that non-exclusive shared access is an unproven and possibly unworkable "experiment." As CTIA articulates it, "a wholesale sharing and complex coordination approach, similar to what has been adopted for the 3.5 GHz band, has not been implemented in a commercial system and remains, at best, experimental."[7]

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[5] *See* 47 CFR 1.429(b).
[6] *Id*.
[7] Petition for Reconsideration of CTIA, GN Docket No. 14-477 *et al.* (Dec. 14, 2016)("CTIA Petition"), at 25.

Even assuming the Commission should never try anything new or innovative when it comes to promoting more intensive spectrum use, Petitioners' argument that use of a geolocation database to manage access to a band is "experimental" has a very short shelf life: By the time the Commission certifies either an already-operating SAS or a new geolocation database to implement sharing in the 37-37.6 GHz band, the effectiveness of an automated database certified by the Commission will be well-established in the 3.5 GHz CBRS band. Seven companies, including Petitioner CTIA, have filed applications to be certified as SAS administrators and demonstrations by Google and others have shown the geolocation database mechanism is highly reliable and scalable.[8] Moreover, it should be noted, the *Report & Order* decided only that the lower band segment would be shared, not how. The question of *how* shared use of the 37-37.6 GHz band will be implemented – including whether a SAS or some other mechanism will be used – remains pending pursuant to the *FNPRM.*

In addition, dynamic sharing in the 37-37.6 GHz band will be *less* complex than protecting Navy radar in 3.5 GHz. No sensing system is needed and no Shared Access licensees will be required to change channels on short notice. Sharing is a more static and straightforward coordination challenge at 37-37.6 GHz. Moreover, the Commission can make dynamic sharing coordinated by an automated SAS or other database mechanism contingent on testing and certification. The Commission adopted this approach with respect to both the SAS and an Environmental Sensing Capability (ESC) required to ensure protection of Federal incumbent

[8] *See* Julius Knapp and Jon Wilkins,"Continuing Momentrum in the 3.5 GHz Band," FCC Blog (May 17, 2016), *available at* https://www.fcc.gov/news-events/blog/2016/05/17/continuing-momentum-35-ghz-band. The FCC's blog reported: "There is a significant and growing community of innovative technology developers and potential operators that are invested in the success of the 3.5 GHz band, the SAS and ESC-enabled sharing scheme, and the potential of these new sharing tools." *Ibid*.

operations at 3.5 GHz. At the time the Commission adopted the CBRS Order, it was "unproven" whether a combination of a SAS and sensing would protect Navy radar. But the remedy was to make the full-blown sharing contingent on a successful implementation – which, 18 months later, is close at hand. An application, testing and public notice process for a mmW SAS would likewise be a prudent safeguard for 37-37.6 GHz.

A second recycled argument for reconsideration, emphasized by T-Mobile, is that the Commission's goal to provide "easy access to spectrum" for diverse uses and users (e.g., inside factories, office buildings, schools and other venues with specialized needs) "is already feasible in millimeter wave spectrum at 57-64 GHz, which is designated for unlicensed use."[9] The assertion that unlicensed allocations above 60 GHz are a complete substitute for the benefits of dynamic, license-by-rule sharing of the lower 37 GHz band segment (37-37.6 GHz) falls short in several respects:

First, the propagation characteristics and channel sizes of the 37 and 60 GHz bands are entirely different. The unlicensed WiGig technologies already coming to market based on a combination of extremely wide channels (2.16 GHz wide) and attenuated propagation above 60 GHz focus on high-capacity in-room connections (e.g., video router to screens) that are very different than the 5G and IoT use cases that should be expected at 37-37.6 GHz. Thanks to the operability requirement across the 37-39 GHz band, we expect that thousands of small operators and tens of thousands of individual venues (from school and industrial campuses to factories, hotels, and convention centers) will deploy "5G" gear using 37-37.6 GHz spectrum, but in innovative, customized and/or carrier-neutral configurations that would not be possible if those

[9] T-Mobile USA, Inc. Petition for Reconsideration, GN Docket No. 14-477 *et al.* (Dec. 14, 2016)("T-Mobile Petition"), at 6.

users had to go to a one-time auction and purchase an expensive wide-geographic-area exclusive license. In other words, the diversity of spectrum access the Commission is creating for the lower 37 GHz band segment will spur innovations in uses that are both entirely different from unlicensed technologies above 60 GHz and complementary to 5G technologies deployed above 37.6 GHz. Indeed, what the Commission should really be reconsidering is its decision to set aside a mere 600 megahertz of mmW spectrum for this highly-productive purpose.

Second, like the GAA spectrum in the upper segment of the 3.5 GHz band, SAL spectrum in the lower segment of the 37-39 GHz band, facilitated by band-wide operability, will encourage innovation, investment and deployment among both upper segment licensees and opportunistic users across the entire band. Upper segment licensees can expand their operations at low cost by adding capacity using 37-37.6 GHz spectrum, even if it's on an as-needed or best-efforts basis.[10] Because coverage areas will be very small, it's highly likely that a licensee with exclusive access to a channel or two above 37.6 GHz will discover it can greatly enhance that capacity with opportunistic access to 37-37.6 GHz spectrum. While we understand why the cellular industry wants to eliminate the ability of potential competitors or potential customers (venues) to have access to 37-37.6, it's also ironic that the licensees above 37.6 GHz will be in the best position to make low-cost use of the lower-band segment.

For small operators, innovators and individual venues, the availability of 600 megahertz of open and shared GAA-like spectrum in the lower 37 GHz segment enables at least a modest deployment without an exclusive and expensive geographic-area license and encourages the

[10] The *Report & Order* explicitly acknowledged these benefits to both small operators and exclusive licensees: "SALs will be widely available to provide easy access to spectrum, including for new innovative uses and for targeted access where and when providers need additional capacity." *Report & Order* at ¶ 117.

opportunistic use of vacant spectrum *above* 37.6 GHz. Without the availability of the 37-37.6 GHz band segment on a GAA-like basis, potential innovators, operators and market entrants would be far less likely to invest in equipment that relies on temporary, opportunistic access to licensed spectrum that could be foreclosed at a later date, stranding their investment. As the *Report & Order* recognizes, "users in the shared portion of the band will benefit from efforts by equipment manufacturers and licensees to develop equipment for the portion of the band licensed on a geographic area basis."[11]

Another opportunity loss associated with limiting the entire 37-40 GHz band to exclusive licenses based on large geographic areas stems from the mismatch between what a very limited number of 37 GHz licensees will choose to deploy (based on a common denominator business model) and the specialized needs and priorities of a diverse range of users and uses, from industrial automation to health systems management to university campuses. As Google commented, "extending the wide-area exclusive licensing approach employed in the lower frequencies would establish a high barrier to entry and fail to 'facilitate sharing among a wide variety of users and platforms.'"[12] Direct access to a substantial amount of mmW capacity would likely spur a flowering of third-party providers to design local area networks customized to meet the particular needs of each different industry vertical, as well as households and community anchor institutions. Simply having the option to deploy a very high-capacity network indoors without the need to rely on a small number of licensed spectrum intermediaries is likely to spur more competition and innovation that extends far beyond the operators that initially gobble up the newly available wide area licenses.

[11] *Report & Order* at ¶ 112.
[12] Comments of Google, GN Docket No. 14-477 *et al.* (Jan. 27, 2016), at 3.

A third argument for reconsideration made by several Petitioners is the claim that "there is no support in the record" for reserving a portion of the 37 GHz band for non-exclusive sharing with Federal incumbent and future users.[13] This is simply not true. A diverse range of stakeholders – including companies, consumer advocates and the NTIA – supported variations on hybrid shared access frameworks for the 37 GHz band as a means of promoting innovation, market entry, intensive spectrum re-use, and access by more diverse uses and users. In comments and reply comments, PK and OTI specifically proposed applying the three-tier Part 96 framework the Commission adopted for the 3.5 GHz band to the 37 GHz band. Our filings urged the Commission to divide the 37 GHz band equally between Priority Access Licenses (PALs) and General Authorized Access, with GAA users sharing 800 megahertz in the lower segment of the 37 GHz band (37-37.8 GHz) dynamically with Federal users and subject to coordination by a "mmW Spectrum Access System."[14] Starry Inc., a fixed wireless start-up, made a similar proposal, which was also cited in the *Report & Order*.[15]

[13] T-Mobile Petition at 6. *See also* CTIA Petition at 25 (FCC "ignored the record" that supported exclusive licensing by geographic area); 5G Americas Petition for Reconsideration, GN Docket No. 14-477 *et al.* (Dec. 14, 2016)("5G Americas Petition"), at 4 (the decision "appears to reflect a 'spectrum grab' by the Federal government" that surfaced only after an *ex parte* letter from NTIA).

[14] Comments of Open Technology Institute and Public Knowledge at 13-15 ("OTI and PK recommend that the Commission divide the [37 GHz] band's 1,600 megahertz into two contiguous blocks of 800 megahertz for shared GAA and 800 megahertz for PA licensing"). In support OTI/PK cited the Commission's conclusion in the 3.5 GHz Report & Order that "ensuring that a stable and significant quantity of spectrum is available for both Priority Access Licensees and GAA will foster innovation, encourage efficient use of the band, and create an environment conducive to a wide array of potential users and uses." *Amendment of the Commission's Rules in Regard to Commercial Operations in the 3550-3650 Band*, Report and Order and Further Notice of Proposed Rulemaking, GN Docket No. 12-354 (rel. April 21, 2015), at ¶ 64.

[15] Starry Inc., *Ex Parte* Letter (May 5, 2016).

Other stakeholders supported variations of hybrid and dynamic shared access to the 37 GHz band. The Dynamic Spectrum Alliance (DSA), a global coalition of large high-tech companies, argued that "in bands where the Commission decides to assign exclusive licenses, it should consider adopting a three-tier sharing framework similar to the one recently adopted for the 3550-3700 GHz band."[16] DSA noted that the feasibility of geolocation database mechanisms would "allow intensive sharing among a diversity of users."[17] Facebook stated that "[s]pectrum access systems and related technologies can manage spectrum access for incumbent users and priority users while allowing general access to the spectrum and allowing for two-way sharing between Federal and commercial users. . . . Moreover, by establishing a tiered framework that would allow sharing between licensees and general access users, the Commission would avoid the risk of licensed spectrum being left to lie fallow."[18]

Federated Wireless supported the hybrid licensing scheme proposed in the *NPRM*, which would have granted "local area" operating rights for indoor use to property holders on a licensed-by-rule basis.[19] Huawei and our groups supported variations of this concept.[20] And far from ignoring the record, the Commission specifically declined to adopt that hybrid authorization

[16] DSA Reply Comments at 3.
[17] *Id. See also* Federated Wireless Comments at 20-21; Comments of NCTA, GN Docket No. 14-177, *et al.* (Jan. 28, 2016), at 11; OTI/PK Comments at 19-20.
[18] Facebook, *Ex Parte* Presentation, GN Docket No. 14-177, *et al.* (June 21, 2016), at 2-3. In its initial comments, Facebook supported "a balanced approach utilizing licensed, unlicensed, and hybrid mechanisms . . . that will best accommodate a wide variety of services, providing multiple opportunities to put the spectrum to use, and encourage the development of different technologies and business models in these bands." Comments of Facebook, GN Docket No. 14-177, *et al.* (Jan. 28, 2016), at 5.
[19] Federated Wireless Comments at ii, 15-18 ("The Commission should adopt the hybrid licensing scheme proposed for the 37 GHz band because it will efficiently allocate spectrum for indoor uses, support an important service need, and exploit the natural propagation characteristics of the band").

scheme "because it is unsupported by the record."[21] Instead it adopted a variation on two other options described in the *NPRM*.

The most specific record support for non-exclusive sharing of the 37–37.6 GHz band came from the NTIA, which filed a detailed and technical *ex parte* letter last July 12 stating the agency "supports a flexible and innovative sharing framework in the 37-38.6 GHz band."[22] NTIA specifically proposed the 37–37.6 MHz lower band segment for dynamic sharing. The agency explained that current NASA operations and planned deployments at 14 military facilities will require ongoing and flexible use of the lower band segment. NTIA stated that one of the government's specific objectives is to share on a co-primary basis and through mechanisms that "accommodate potential future developments in technology and equipment" by Federal agencies, including expanded use of the band.[23]

Like small operators and venues, non-exclusive sharing on a license-by-rule basis will give DoD and other Federal users the flexibility to extend their own operations and take advantage of mass-market commercial equipment in the future. "Federal and non-federal users would access the band through a coordination mechanism, including exploration of potential dynamic sharing mechanisms in the lower 600 megahertz that can be developed through a federal and industry collaborative process," NTIA stated.[24] Accordingly, the Commission explained at length in the *Report & Order* why non-exclusive sharing on a licensed-by-rule basis satisfies "the twin goals of expanding commercial access in this band while facilitating continued

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[20] Comments of Huawei, GN Docket No. 14-177, *et al.* (Jan. 28, 2016), at 19; Comments of OTI/PK at 16-19.
[21] *Report & Order* at ¶ 111.
[22] *Ex Parte* Presentation of NTIA, GN Docket No. 14-177, et al. (July 12, 2016), at 1.
[23] *Id* at 4.
[24] *Ibid*.

and expanded Federal use."[25] The *Report & Order* also considered the interests of satellite services and concluded that co-primary, shared access in the lower band segment "provides satellite operators the certainty they need to be able to expand their operations into the 37 GHz band in the future."[26]

A final recycled argument set forth by cellular industry Petitioners is that exclusive licensees can more effectively coordinate with co-primary Federal operations."[27] CTIA even implies that NTIA would prefer to deal directly with a relatively small number of exclusive licensees rather than rely on an automated governance mechanism (e.g., a geolocation database) to protect Federal users from interference.[28] However, in its detailed filing, NTIA expressed no preference for coordination with either exclusively-licensed or license-by-rule operations, but simply stated that "a coordination mechanism, including exploration of potential dynamic sharing mechanisms in the lower 600 megahertz that can be developed through a federal and industry collaborative process."[29] As noted above, DoD and other Federal users of spectrum know full well that if exclusive and permanent wide-area licenses for the 37–37.6 GHz band are auctioned, Federal users will have no flexibility to expand or evolve their own use of the band, but instead will be frozen in place and under mounting pressure to relocate out of the band entirely over time.[30]

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[25] *Report & Order* at ¶ 102.
[26] *Id*. at ¶ 112.
[27] *See* CTIA Petition at 25; Petition for Reconsideration of Competitive Carriers Association, GN Docket No. 14-477 *et al.* (Dec. 14, 2016)("CCA Petition), at 7; T-Mobile Petition at 6-7.
[28] CTIA Petition at 26.
[29] *Ex Parte* Presentation of NTIA, GN Docket No. 14-177, *et al.* (July 12, 2016), at 4.
[30] CTIA Petition at 25-26.

IV. Operability Across the Entire 37 – 40 GHz Band Promotes More Widespread Deployment, Competition and Flexibility for Commercial and Federal Users.

PK and OTI strongly support retaining an operability requirement that applies to both the lower and upper portion of the 37 GHz band. The Commission correctly concluded in the *Report & Order* that band-wide operability will "help further efforts to facilitate sharing between Federal and non-Federal users, and will give Federal users and consumers an opportunity to take advantage of speed-to-market and lower cost of broadly deployed commercial technologies, and provide Federal users opportunities for current use and future growth."[31] An operability requirement serves the same public interest purposes as the similar requirement adopted by the Commission for the entire CBRS band (3550 – 3700 MHz). It encourages a mass-market device ecosystem for small providers and promotes competition by lowering the risk that chips, devices or standards will be tailored only to the post-auction holdings of the very largest 5G ISPs.

CCA and most other mobile industry Petitioners complain that applying the operability requirement to the lower 37–37.6 GHz band segment "before a sharing regime for the lower 37 GHz band is determined would delay equipment development, investment, and deployment across the entire band."[32] CCA proposes "exclud[ing] the 37-37.6 GHZ band from the operability requirements while the sharing regime is being finalized and until there are rules governing the band."[33] 5G Americas asks the Commission to eliminate the requirement "or alternatively remove the operability requirement for the full band until the 37 GHz sharing rules have been finalized."[34] TIA acknowledges "it may eventually turn out that there is no impact, depending upon the specific sharing mechanism adopted," but suggests that as an interim

[31] *Report & Order* at ¶ 117.
[32] CCA Petition at 14.
[33] *Ibid*.

measure "the 37-40 GHz operability requirement should be clarified now to explicitly state that any mobile or transportable device will meet the requirement if it is tunable across this band on each air interface it uses to operate in the band."[35] CTIA, for its part, does not address the issue.

Under the Commission's proposal – and thanks to the Commission's operability requirement – the different access regimes for the lower and upper segments of the 37 GHz band instead become complementary, each enhancing the value of the other, exactly as the operability requirement and diversity of access offered by PAL and GAA spectrum at 3.5 GHz is likely to do. [36] As we explained in the section above, the SAL spectrum in the lower segment of the 37 – 39 GHz band, facilitated by band-wide operability, will encourage innovation, investment and deployment by both upper segment licensees and opportunistic users across the entire band. Upper segment licensees can expand their operations at low cost by opportunistically using 37–37.6 GHz spectrum, even if it's on an as-needed or best-efforts basis, "where and when providers need additional capacity."[37] A far larger number of other companies, community anchor institutions and other parties will benefit from "easy access to spectrum, including for new and innovative uses."[38]

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[34] 5G Americas Petition at 9.
[35] Petition for Reconsideration of the Telecomunications Industry Association, GN Docket No. 14-477 *et al.* (Dec. 14, 2016)("TIA Petition"), at 5-6.
[36] *See Report & Order* at ¶ 112 ("users in the shared portion of the band will benefit from efforts by equipment manufacturers and licensees to develop equipment for the portion of the band licensed on a geographic area basis").
[37] *See Report & Order* at ¶ 117.
[38] *Ibid*.

V. The Adopted Cybersecurity Plan Disclosure Rules are a Necessary Tool to Protect 21st Century Networks from 21st Century Threats.

A. Petitioners Misrepresent the Requirements Imposed by the Cybersecurity Reporting Requirements, and Summarily Dismiss the Public Interest Benefits.

Next-generation networks must be built to address threats to network and user security. While defense-in-depth remains the best practice, and it is essential that all participants in the network ecosystem take steps to protect networks, services, and users from cybersecurity threats, network operators are uniquely positioned and face unique challenges. In commencing the rulemaking, the Commission wrote that "one of the key challenges facing the developers of new services is to support numerous distinctly different possible uses in a secure manner."[39] As several of the Petitions for Reconsideration indicate, however, those companies in the business of providing wireless communications services seem opposed to any requirement that they actually explain their actions, and in some cases opposed to any requirement which doesn't allow them to report inaction without consequence.

NCTA argues that the requirements of Section 30.8 are "more likely to expose 5G networks to cybersecurity threats" because "the high-level information the rule requires UMFUS licensees to disclose may unintentionally reveal a vulnerability that bad actors could exploit."[40] T-Mobile goes further, arguing that "there is no need for the Commission to unnecessarily insert itself into network design."[41] CTIA decries the Commission's action, complaining that "it seems unlikely that the FCC will be satisfied . . . with a statement that 'no steps have been taken.'"[42]

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[39] Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, *et al*., GN Docket No. 14-177, *Notice of Proposed Rulemaking*, FCC 15-138, ¶ 260 (Oct. 23, 2015) ("NPRM").
[40] Petition for Partial Reconsideration of NCTA – The Internet & Television Association, GN Docket No. 14-477 *et al.* (Dec. 14, 2016)("NCTA Petition"), at 2.
[41] T-Mobile Petition at 15.
[42] CTIA Petition at 13.

These statements reflect a desire on the part of network operators to be free from any responsibility for the cybersecurity of their own networks, even while insisting that "providers of wireless communications services have ample incentive to ensure that their networks are sufficiently protected."[43]

The Commission fails in its obligation to serve the public interest if it does not ensure that America's communications infrastructure is safe and secure.[44] Toward that end, the Commission has acted by implementing Section 30.8 to ensure that providers are taking whatever steps they deem appropriate in furtherance of that objective. Contrary to the assertions of Petitioners, the Commission's requirements under 30.8 do not put at risk sensitive network information. The reports simply require that licensees disclose *at a high level* what actions they are taking to address concerns in particular areas of concern. This is not prescriptive regulation - it does not dictate what actions operators must take, merely that they must report on their efforts in these areas. If, as T-Mobile insists, operators have ample incentive to address these issues on their own, the reporting requirement will be merely administrative and not unduly burdensome.

CTIA's concern that the Commission may not be satisfied with inaction on the part of an operator may well prove correct, and indeed, the Commission should not be satisfied with inaction. The Commission's mandate under 47 USC 151 requires no less than certainty that the nation's communications infrastructure is secure and stable. Inaction on the part of network operators with regard to cybersecurity should not be tolerated. The Commission should not look kindly on any demand by network operators that they be permitted to disregard security concerns of their networks, as CTIA suggests would be appropriate.

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[43] T-Mobile Petition at 14-15.
[44] *See* 47 USC § 151.

In sum, the Commission's cybersecurity reporting requirements under Section 30.8 are straightforward and not unduly burdensome. They simply require that network operators, who claim to have ample incentive to do so, simply report at a very high, very general level, on the actions they are taking to protect and secure our nation's 5G communications infrastructure. Since Petitioners effectively seek to avoid any accountability or requirement to be held accountable for their action or inaction on these important issues, their requests conflict with the FCC's foundational goals, and should be summarily dismissed.

B. Petitioners had Ample Notice of the Potential for Security-related Commission Action, Negating Any Claim of Violation of the Administrative Procedures Act.

Petitioners are incorrect to assert a lack of notice regarding network security issues. The APA does not require, as NCTA suggests, that the Commission "tee up the specific text of Section 30.8 in its proposed rules."[45] The APA requires simply that parties be on notice of the topic being discussed, and that "[a] final rule the agency adopts must be 'a "logical outgrowth" of the rule proposed.'"[46] Section 30.8, which requires only that network operators provide the Commission with the information it needs to answer these questions, but which does not prescribe any specific action on the part of network operators, is just such a logical outgrowth of the detailed questions set forth in the NPRM.

The APA does not require, as NCTA suggests, that the precise text of a proposed rule be included in an NPRM.[47] The APA only requires that it satisfy the logical outgrowth test, which holds that "A final rule is a logical outgrowth if affected parties should have anticipated that the

[45] NCTA Petition at 6
[46] *Long Island Care at Home, Ltd. v. Coke*, 551 U.S. 158, 174 (2007) (quoting *Nat'l Black Media Coal. v. FCC*, 791 F.2d 1016, 1022 (2d Cir. 1986) (further citations omitted)).
[47] NCTA Petition at 6.

relevant modification was possible."[48] More specifically, an agency's proposed rule "satisfies the logical outgrowth test if it 'expressly ask[s] for comments on a particular issue . . .'"[49]

In the NPRM, the Commission sought "comment on how to ensure that effective security features are built into key design principles for all mmW band communications devices and networks."[50] Specifically, the Commission sought comment regarding the "common network security triad of confidentiality, integrity, and availability,"[51] known as the "CIA triad" and relied upon as a framework by organizations such as the Department of Homeland Security's National Security Telecommunications Advisory Committee ("NSTAC").[52] In broad terms, the Commission sought to understand the security needs of next-generation 5G networks, and asked for information on what can and should be done to ensure that the CIA triad are integrated into 5G networks at a fundamental level.

NCTA, CCA, T-Mobile, and CTIA chose not to respond to these questions in their comments in response to the NPRM. Deeming this information important to ensuring the security and reliability of 5G wireless networks, the Commission developed Section 30.8 to ensure that the agency would have the information it needs to do its job going forward. While Petitioners complain of inadequate notice, the D.C. Circuit has been clear: asking for comments on a particular issue is enough to put on notice that the Commission may implement a rule

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[48] *Allina Health Servs. v. Sebelius,* 746 F.3d 1102, 1107 (D.C. Cir. 2014) (citing *CSX Transp., Inc. v. Surface Transp. Bd.*, 584 F.3d 1076, 1080 (D.C. Cir. 2009)).
[49] *U.S. Telecom Ass'n v. FCC*, 825 F.3d 674, 700 (D.C. Cir. 2016) (quoting *CSX Transp.*, 584 F.3d at 1081).
[50] NPRM at ¶ 261.
[51] *Id*.
[52] NSTAC, *An Assessment of the Risk to the Cybersecurity of the Public Network*, 2014 (noting the importance of providing network security to physical communications network components "which if damaged or manipulated, could degrade the *confidentiality, integrity, and availability* of data transiting the Internet.") (emphasis added).

growing out of those questions.[53] It is only a small logical step to go from asking questions to requiring answers, particularly when industry chooses to ignore the agency's questions. While Petitioners may have chosen not to act in response to their notice, they are incorrect to assert that the Commission's actions constitute an APA violation, or that they somehow lacked the fair notice required by law.

VI. Revising the Commission's Spectrum Allocations to Lock Up Even More Valuable Spectrum Under Exclusive Wide-Area Licenses Would Not Serve the Public Interest

A number of petitioners[54] oppose the allocation of all or part the 64-71 GHz band for unlicensed use. Citing an unequal allocation between licensed and unlicensed bands (while failing to acknowledge that unlicensed spectrum is equally available for use by established carriers as licensed spectrum), these Petitioners argue that things would be more fair if "as little as 5 GHz" of the 64-71 GHz band were reallocated for exclusively licensed use. To the contrary, ratcheting back on the innovation and economic growth enabled by unlicensed spectrum and tipping the supposedly unfair balance between unlicensed and licensed spectrum so far in favor of the very large and expensive licenses preferred by incumbent carriers would not serve the public interest. Public Knowledge and New America's Open Technology Institute oppose any such redistribution of spectrum.

A. Petitioners Diminish or Disregard the Economic Value of Unlicensed Spectrum as Justification for Reallocation Unlicensed Bands for Exclusive Licensed Use.

In arguing against the allocation of the 64-71 GHz band for unlicensed use, Petitioners overlook the substantial economic value of unlicensed spectrum. One 2014 study estimated that, by 2017, unlicensed spectrum technologies will contribute at least $547 billion in annual

[53] *See U.S. Telecom Ass'n,* 825 F.3d at 700.
[54] *See, e.g.,* CTIA Petition at 19; T-Mobile Petition at 7; CCA Petition at 7.

economic surplus. This economic value cannot be dismissed out of hand.[55] Furthermore, unlicensed spectrum directly supports the business model of wireless carriers, since recent estimates suggest WiFi carries 80% of mobile device data traffic.[56] There is no reason to believe that unlicensed spectrum – and variations of Wi-Fi, such as WiGig – will not continue to play this complementary role as the workhorse of the wireless ecosystem.

In the future, unlicensed spectrum will be even more important for U.S. economic growth. According to Cisco, by 2020, the Internet of Things will connect 50 billion devices, with an economic impact estimated at $19 trillion.[57] Similarly, McKinsey has estimated that IoT applications could have an economic impact of up to $33 trillion by 2025.[58] The vast majority of IoT traffic already travels over unlicensed spectrum, and that will continue to be true.

It is in the economic interest of both the carriers, and the public interest more broadly, for unlicensed spectrum to be allocated in generous amounts to facilitate the deployment of next-generation unlicensed technologies upon which consumers, competitors, and the carriers themselves, will inevitably rely.

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[55] Telecom Advisory Services, LLC., *Assessment of the Future Economic Value of Unlicensed Spectrum in the United States* (Aug. 2014), *available at* http://www.wififorward.org/wp-content/uploads/2014/01/Katz-Future-Value-Unlicensed-Spectrum-final-version-1.pdf.

[56] Sean Kinney, *Analyst: Wi-Fi Carries 80% of Mobile Data Traffic* RCR Wireless News (Jul. 7, 2016), http://www.rcrwireless.com/20160707/network-infrastructure/wi-fi/analyst-wi-fi-carriers-80-mobile-data-tag17. Mobidia, which measures the actual usage of tens of thousands of consumers, reported that Wi-Fi is already carrying an average of 80 percent of total mobile device data traffic as of year-end 2014. *See* Mobidia, "Network Usage Insights: Average Data Usage for LTE, 3G and Wi-Fi of Wireless Subscribers in the USA, Q3 2014" (Nov. 2014).

[57] Olga Kharif, *Cisco CEO Pegs Internet of Things as $19 Trillion Market*, BLOOMBERG BUSINESS (Jan. 8, 2014), http://www.bloomberg.com/news/articles/2014-01-08/cisco-ceo-pegs-internet-of-things-as-19-trillion-market.

[58] Mohana Ravindranath, *Cisco CEO at CES 2014: Internet of Things is a $19 trillion opportunity*, The Washington Post (Jan. 8, 2014), http://www.washingtonpost.com/business/on-it/cisco-ceo-at-ces-2014-internet-of-things-is-a-19-trillion-opportunity/2014/01/08/8d456fba-789b-11e3-8963-b4b654bcc9b2_story.html.

B. Increased Allocation Of Exclusively Licensed Spectrum Increases The Likelihood That Valuable Spectrum Will Lie Fallow, Inhibiting Deployment And Reducing The Public Benefits Of 5G Technology.

Due to the propagation characteristics of mmW spectrum, it is a near-certainty that the vast majority of "5G" mobile deployments in the band will be small or microcell-sized. As a result, coverage areas for each cell will be small, with deployments by licensed providers likely focused in urban areas and within buildings. Licensing these bands on an exclusive basis across broad geographic areas, as desired by Petitioners, will ensure that residents and competitors will not be able to deploy 5G services in those areas not rapidly served by the licensees, or even to self-provision complementary or alternative high-bandwidth networks.

Unlicensed spectrum, on the other hand, remains accessible to incumbent carriers for deployment where necessary, but also remains available for open access, allowing individuals and competitors to access spectrum to deploy their own services in areas licensees deem unworthy of investment. Broad allocations of unlicensed spectrum or, at a minimum, robust spectrum sharing systems or use-or-share provisions, are essential to ensure that any areas other than the urban core. Public Knowledge and New America's Open Technology Institute strongly believe that allocations for unlicensed promote innovation and economic growth, and should not be curtailed in favor of locking up substantial amounts of valuable spectrum under license terms which will not lead to deployment, particularly in those communities which most need additional connectivity.

VII. Conclusion

PK and OTI strongly support the framework adopted in the *Report & Order*, with shared access to the 37–37.6 GHz band authorized on a license-by-rule basis, an expanded and complementary wide band of unlicensed spectrum that extends from 57 to 71 GHz, and

cybersecurity plans that adequately protect the public. Open and shared public access to the 37–37.6 GHz and 64–71 GHz bands are prime candidates to create intensively used "innovation bands" that also promote the widest possible range of uses and users, while protecting both the current use and future flexibility of Federal users. Accordingly, the Commission should reject efforts to undermine the rules established for these critical bands, and to relitigate issues and revisit arguments already addressed and rejected by previous Commission action.

Respectfully Submitted,

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