

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Expanding Flexible Use in Mid-Band Spectrum) GN Docket No. 17-183
Between 3.7 and 24 GHz)

REPLY COMMENTS OF VERIZON

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I. INTRODUCTION AND SUMMARY

Commenters overwhelmingly recognize the importance of mid-band spectrum to the future of successful 5G technological development and deployment, particularly in the 3.7-4.2 GHz band. Given the growing need for additional mid-band spectrum and the potential value of the 3.7-4.2 GHz band to the 5G effort, Verizon joins other commenters in calling for the Commission to move quickly to a Notice of Proposed Rulemaking on at least this important band. Also, while opinions differ, the record supports further consideration of the 6 GHz bands for mobile flexible use, while demonstrating the need to ensure that incumbent services in both bands have adequate interference protections.

II. THE RECORD DEMONSTRATES THE NEED FOR MORE MID-BAND SPECTRUM FOR 5G AND RAPID ADOPTION OF AN NPRM.

A. Mid-band spectrum is essential for 5G.

Commenters, across multiple industry segments, agree that mid-band spectrum is critically important for the success of 5G.¹ In particular, a broad range of commenters, including satellite industry stakeholders,² agree that the 3.7-4.2 GHz range has optimal characteristics for

¹ See, e.g., Comments of CTIA, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (“CTIA Comments”); Comments of Charter, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (“Charter Comments”); Comments of Qualcomm, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (“Qualcomm Comments”); Comments of Federated Wireless, GN Docket No. 17-183 (filed Oct. 2, 2017) at 7 (“Federated Wireless Comments”); Comments of T-Mobile USA, GN Docket No. 17-183 (filed Oct. 2, 2017) at 8 (“T-Mobile Comments”); Comments of Intelsat, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (“Intelsat Comments”); Comments of MVDDS 5G Coalition, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (“MVDDS 5G Coalition Comments”); Comments of Telecommunications Industry Association, GN Docket No. 17-183 (filed Oct. 2, 2017) at 5 (“TIA Comments”).

² See, e.g., Joint Comments of Intelsat and Intel, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (Acknowledging that “The propagation characteristics as well as global 5G development plans make the 3700-4200 MHz band highly valuable and attractive for terrestrial mobile use.”) (“Joint Intel Comments”).

terrestrial mobile use.³ Verizon agrees with Nokia’s assessment that the 3.7-4.2 GHz band is “the most favorable mid-band spectrum range to introduce 5G services in the U.S.”⁴ Given this underutilized band’s unique value and potential to quickly provide a mid-band foothold for 5G, the record demonstrates that the Commission should move swiftly to ensure that the 3.7-4.2 GHz band is available for wireless broadband as soon as possible.

B. Numerous commenters support licensed, flexible use in the 3.7-4.2 GHz range.

The record contains strong support for permitting licensed, flexible use in the 3.7-4.2 GHz band.⁵ Ericsson correctly observes that exclusive, flexible use licensing would best promote investment, innovation, and rapid deployment in the band.⁶ Including mobile among the authorized uses will ensure that mobile broadband services, with their \$400B annual contribution to the U.S. economy and more than 396 million subscribers, are not left behind.⁷

The claim by some commenters that the Commission should first authorize point-to-multipoint fixed wireless before allowing flexible use⁸ seems misguided. Point-to-multipoint arrangements should be authorized as a component of flexible use, but authorizing only that use would violate the substantial body of Commission precedent favoring flexible, exclusive use

³ See, e.g., CTIA Comments at 2; Comments of Competitive Carrier Association, GN Docket No. 17-183 (filed Oct. 2, 2017) at 3 (“CCA Comments”).

⁴ Comments of Nokia, GN Docket No. 17-183 (filed Oct. 2, 2017) at 2 (“Nokia Comments”).

⁵ See, e.g., CTIA Comments at 2; Nokia Comments at 2; Comments of Ericsson, GN Docket No. 17-183 (filed Oct. 2, 2017) at 5-6 (“Ericsson Comments”).

⁶ Ericsson Comments at 5-6.

⁷ See Letter from Scott K. Bergmann, CTIA, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, et al. (filed Sept. 5, 2017).

⁸ See, e.g., Comments of the Broadband Access Coalition, GN Docket No. 17-183 (filed Oct. 2, 2017) at 1 (BAC Comments); Comments of Google, GN Docket No. 17-183 (filed Oct. 2, 2017) at 2 (“Google Comments”).

spectrum.⁹ The principle that the Commission should not substitute its judgment for that of the market underpins that precedent. Within this framework, the Commission should make spectrum available with minimal encumbrances or restrictions to permit the market to determine the best use, whether point-to-multipoint or mobile.

C. The Commission should move quickly to adopt an NPRM.

The race for 5G leadership is already well underway and there is a broad consensus that mid-band spectrum will help advance America’s 5G ambitions. But this race is not just to outrun the rest of the world; it is to continue to meet U.S. consumers’ insatiable demand for more data and faster, more responsive, service. To accomplish this the Commission must move swiftly to free up more mid-band spectrum, particularly in the 3.7-4.2 GHz range and move to issue an NPRM in the 3.7-4.2 GHz and 6 GHz bands, as strongly endorsed in the record.¹⁰

⁹ See, e.g., *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, 29 FCC Rcd 6567 at ¶740 (establishing flexible use rules in the 600 MHz band); *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, 30 FCC Rcd 3959, at ¶ 174 (2015) (establishing flexible use rules in the 3.5 GHz band); *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services Establishing a More Flexible Framework to Facilitate Satellite Operations in the 27.5- 28.35 GHz and 37.5-40 GHz Bands*, GN Docket No. 14-177, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014, at ¶ 161 (2016) (establishing Upper Microwave Flexible Use Service for flexible use rules in the 28, 37, and 39 GHz bands).

¹⁰ See, e.g., CTIA Comments at 2; Nokia Comments at 19; Ericsson Comments at 5; Comments of Mid-Band Spectrum Coalition, GN Docket No. 17-183 (filed Oct. 2, 2017) at 2 (“Mid-Band Spectrum Coalition Comments”).

D. Fixed satellite and microwave use have diminished.

The record does not support claims that the 3.7-4.2 GHz band is heavily used.¹¹ As noted to the Commission in the initial comment cycle, both Fixed Satellite Service (FSS) and Fixed Service (FS) microwave use in the 3.7-4.2 GHz, “C-band,” has diminished.¹² According to Google, 1,371 (29%) of the 4,724 IBFS-registered C-band FSS sites are not being used for satellite service.¹³ SIA insists that the Commission act to “ensure that C-band satellite services can continue to thrive and grow.” But the Commission’s licensing data reveals that satellite use of the band is not only not growing, but has steadily declined for decades.¹⁴

Several commenters suggest wrongly that C-band is an irreplaceable transmission medium for video content distribution.¹⁵ In fact, its use to distribute video content is declining as a proportion of all video distribution methods as use of other frequency bands or fiber increases.¹⁶ The Commission could repurpose this spectrum for more valuable future applications for 5G, if the market determines that is its most valuable use.¹⁷

The Commission cannot, and need not, know what use of the band best serves the public interest. But, by allowing flexible use and offering incentives for incumbents to relocate or by eliminating barriers to secondary-market transactions in the band, the Commission could allow market forces to determine the best and highest value use of the band.

¹¹ See, e.g., Comments of Satellite Industry Association, GN Docket No. 17-183 (filed Oct. 2, 2017) at 16-19 (“SIA Comments”); Comments of SES Americom, GN Docket No. 17-183 (filed Oct. 2, 2017) at 3 (“SES Comments”).

¹² Verizon Comments at 11-14.

¹³ Google Comments at 4.

¹⁴ See, Nokia Comments at 7 (detailing the steady decline of registered earth stations and new earth station grants).

¹⁵ See, e.g., SIA Comments at 4 and 7-9; SES Comments at 3; Comments of AT&T, GN Docket No. 17-183 (filed Oct. 2, 2017) at 5 (“AT&T Comments”); Comments of Content Companies Comments, GN Docket No. 17-183 (filed Oct. 2, 2017) at 3 (“Content Companies Comments”).

¹⁶ Nokia Comments at 7.

¹⁷ Verizon Comments at 11-14.

Finally, the record supports the Commission undertaking a review of its licensing database to reconcile the apparent over-registration of FSS earth stations.¹⁸ Verizon further supports Google's proposal that the Commission clean up its licensing records by requiring that all C-band FSS operators review their own IBFS registrations and certify their accuracy.¹⁹ As Google recommends, the Commission should delete any unconfirmed registrations from the database so that they do not receive interference protection. Importantly, such an effort is consistent with the approach the Commission has taken in many other instances when it has sought to repurpose spectrum – requiring incumbent operators to update licensing information prior to a future auction of the spectrum rights.²⁰ The 3.7-4.2 GHz band is far too valuable a resource to be encumbered by erroneous database entries.²¹

¹⁸ See, e.g., Comments of Wi-Fi Alliance, GN Docket No. 17-183 (filed Oct. 2, 2017) at 8; Comments of Microsoft, GN Docket No. 17-183 (filed Oct. 2, 2017) at 3; Comments of Broadband Access Coalition, GN Docket No. 17-183 (filed Oct. 2, 2017) at 8-9; Comments of Dynamic Sharing Alliance, GN Docket No. 17-183 (filed Oct. 2, 2017) at 7; Qualcomm Comments at 3-4; Opposition of Satellite Industry Association to Petition for Rulemaking Filed by Broadband Access Coalition, RM-11791 (filed Aug. 7, 2017) at 8.

¹⁹ Google Comments at 5.

²⁰ *Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band*, PR Docket No. 93-144, Second Report and Order, 12 FCC Rcd 19079, 19088-89, ¶ 72 (requiring the one-time filing of specific information to update the FCC's licensing database); *Amendment of Parts 2 and 90 of the Commission's Rules to Provide for the Use of 200 Channels Outside the Designated Filing Areas in the 896-901 MHz and the 935-940 MHz Bands Allotted to the Specialized Mobile Radio Pool; Implementation of Section 309(j) of the Communications Act – Competitive Bidding; Implementation of Sections 3(n) and 322 of the Communications Act*, PR Docket No. 89-553, PP Docket No. 93-253, GN Docket No. 93-252, Second Order on Reconsideration and Seventh Report and Order, FCC 95-395, ¶ 42 (requiring incumbents to make a one-time filing to update the Commission's licensing database).

²¹ *Id.*

E. Unregistered earth stations are not entitled to interference protection.

Certain commenters claim incorrectly that “thousands” of existing and future earth stations, including receive-only earth stations that the Commission does not require users to register, warrant protection from interference.²² But the Commission has been clear that unregistered receive-only earth stations are not protected.²³ And, as Nokia suggests in its comments, companies should not be permitted to rush in during the pendency of a rulemaking to add new earth stations and station renewals in the hopes of securing interference protection.²⁴ The Commission has successfully established a known and fixed set of licensees in other proceedings to prevent opportunistic filings, and should do so here as well.²⁵

F. The “full band, full arc” licensing regime is inefficient and should be revisited.

Some commenters push to protect earth stations across the entire band and orbital arc under the guise that satellite outages require earth stations to be re-pointed or retuned.²⁶ But “full band, full arc” licensing is spectrally inefficient. Parties could conceivably seek all the available orbital slots and spectrum simply to reserve rights that they *may* require for some future activity. This would allow FSS licensees, which do not pay for their spectrum, to effectively

²² See e.g., SIA comments at 4 and 18.

²³ *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz, Notice of Inquiry*, Notice of Inquiry, 32 FCC Rcd 6373, 6380 ¶ 19 (2017) (“*Mid-Band NOI*” or “*NOI*”) at Fn 19.

²⁴ See Nokia Comments at 12.

²⁵ See e.g., *Revision of Part 22 and Part 90 of the Commission’s Rules to Facilitate Future Development of Paging Systems; Implementation of Section 309(j) of the Communications Act – Competitive Bidding*, WT Docket No. 96-18, PP Docket No. 93-252, First Report and Order, FCC 96-183, ¶ 18 (implementing an interim freeze of paging applications); *Amendment of Parts 1 and 22 of the Commission’s Rules with Regard to the Cellular Service, Including Changes in Licensing of Unserved Area; Amendment of the Commission’s Rules with Regard to Relocation of Part 24 to Part 27; Interim Restrictions and Procedures for Cellular Service Applications*; WT Docket No. 12-40, RM No. 11510, Notice of Proposed Rulemaking and Order, FCC 12-20 ¶ 67 (implementing an immediate freeze on certain Cellular applications).

²⁶ See AT&T Comments at 11; SIA Comments at 3.

“squat” on spectrum rights in case there is a need for some change in the licensed earth station. To put this into context, if the terrestrial fixed service, which also does not pay for spectrum, were afforded a similar opportunity (which it does not have), a terrestrial fixed service applicant could seek licensing of all the various beamwidths (a full 360 degrees around a site) while simultaneously seeking authority for all the potential spectrum at that site, regardless of actual use.

The current licensing mechanism for FSS has allowed copious amounts of spectrum to remain fallow by precluding additional licensing for terrestrial use. The 3.7-4.2 GHz band is far too valuable a public resource to be reserved for system redundancy and speculative future use. Instead, as discussed in detail above, the Commission should require the FSS industry to audit their existing use of the 3.7-4.2 GHz band and provide *actual* operating parameters and application for their earth stations; they should not be allowed to protect the entire band/entire arc based on non-existent use by satellite systems. This will enable the Commission’s licensing records to accurately track satellite usage while simultaneously allowing terrestrial parties a better understanding of the operating environment in the band.

III. THE COMMISSION SHOULD NOT EXTEND THE CITIZENS BROADBAND RADIO SERVICE INTO THE 3.7-4.2 GHZ BAND.

Several commenters mistakenly advocate that the Commission adopt the same Citizens Broadband Radio Service (CBRS) model that it chose for the 3.5 GHz band in the 3.7-4.2 GHz band.²⁷ A model developed to protect federal government users is not necessary here since this is a band of commercial users subject to market forces. With the Commission testing the as-yet

²⁷ See Federated Wireless Comments at 2-7; Comments of Dynamic Spectrum Alliance Comments, GN Docket No. 17-183 (filed Oct. 2, 2017) at 10; Comments of Sony Electronics Inc., GN Docket No. 17-183 (filed Oct. 2, 2017) at 1-2 (“Sony Comments”).

untried CBRS model in the 3.5 GHz band, it should use its well-established and successful flexible, exclusive use, licensing approach in the 3.7-4.2 GHz band. Adopting the complex CBRS model for the 3.7-4.2 GHz band creates a significant and unnecessary risk of jeopardizing rapid deployment of mobile service in this band and advancement of the nation's 5G goals.

The importance of the 3.7-4.2 GHz band also lies in its potential for global harmonization. It is being considered internationally as a prime band for 5G services around the world.²⁸ Because other countries do not use the CBRS framework for the 3.7-4.2 GHz band, a decision by the United States to do so could eliminate the advantages of global harmonization without providing any significant benefit. The Commission should rely on market forces and its extraordinarily successful flexible, exclusive use license framework to this band to enable the U.S. to maintain its worldwide lead in innovation and investment in mobile broadband services.

IV. THE RECORD SUPPORTS CONSIDERATION OF MULTIPLE APPROACHES TO MAKE THE 3.7-4.2 GHZ BAND AVAILABLE FOR FLEXIBLE USE.

A. The Commission has many options worth exploring in an NPRM for freeing the 3.7-4.2 GHz band for flexible, exclusive use.

Commenters expressing concerns on the feasibility of opening the 3.7-4.2 GHz band for flexible use are unnecessarily pessimistic.²⁹ The Commission has successfully tackled much more challenging tasks to free up much smaller amounts of less valuable spectrum. For example, the Commission spent countless years working to develop and auction spectrum in the 220-222 MHz band (a mere two megahertz of spectrum), a spectrum band not well-suited for

²⁸ See, e.g., T-Mobile Comments 7-10; Verizon Comments at 13-14; Mid-Band Spectrum Coalition Comments at 11; Letter of John Giusti, GSMA, to Marlene H. Dortch, Secretary, FCC, RM-11789 (filed Aug. 8, 2017).

²⁹ See, e.g., SIA Comments at 38.

mobile broadband services.³⁰ As Commissioner O’Rielly has stated, given the wealth of options available to the Commission and its experience repurposing spectrum with active incumbents, “accommodating incumbent licensees should not be that difficult.”³¹ Commissioner O’Rielly’s suggested that the Commission should consider methods to both protect incumbents and provide them incentives to leave the band.³² The Commission could consider granting incumbent licensees additional flexibility in order to facilitate market-based arrangements giving incumbents incentives to exit. Or, if that can’t be achieved, it could use innovative, narrowly-defined, sharing techniques to protect legitimate earth stations or fixed links.³³

Similarly, the record provides support for some combination of approaches, including a possible relocation or transition of incumbents to new frequencies or alternative transmission platforms.³⁴ But while there may be multiple possible tools for freeing the 3.7-4.2 GHz band for flexible use, the Commission should prioritize speed in selecting the best approach.

³⁰ See, e.g., *Amendment of Part 90 of the Commission's Rules To Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Services*, PR Docket No. 89-552, Report and Order, 6 FCC Rcd 2356 (1991); *Amendment of Part 90 of the Commission's Rules To Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service*, PR Docket No. 89-552, *Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services*, GN Docket No. 93-252, and *Implementation of Section 309(j) of the Communications Act--Competitive Bidding, 220-222 MHz*, PP Docket No. 93-253, Second Memorandum Opinion and Order and Third Notice of Proposed Rulemaking, 11 FCC Rcd 188 (1995); *Amendment of Part 90 of the Commission's Rules To Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Service*, PR Docket No. 89-552, *Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services*, GN Docket No. 93-252, *Implementation of Section 309(j) of the Communications Act – Competitive Bidding*, PP Docket No. 93-253, Third Report and Order, Fifth Notice of Proposed Rulemaking, FCC 97-57(1997).

³¹ Commissioner Michael O’Rielly, Federal Communications Commission Blog, “A Mid-Band Spectrum Win in the Making.” (July 10, 2017), at <https://www.fcc.gov/news-events/blog/2017/07/10/mid-band-spectrum-win-making>.

³² *Id.*

³³ *Id.*

³⁴ See, e.g., Qualcomm Comments at 5.

B. Verizon supports consideration of relocating incumbent systems to other bands or transmission media.

Several commenters are right to advocate that the Commission explore relocating C-band satellite traffic to other spectrum bands.³⁵ Though some commenters express concern that a transition of C-band satellite systems is not feasible, the higher throughput and greater capacity provided by Ku-band satellites and the advent of interference mitigation technologies that help these systems overcome the impact of rain fade, make this an option worth exploring.³⁶ And many of the current C-band satellites also carry Ku-band transponders.³⁷ The Commission should thus consider the possibility of transitioning C-band traffic to the Ku-band while maintaining some rights for use of C-band capacity as backup when weather or other conditions require. Finally, Ku-band satellite systems can be engineered to mitigate the effects of rain fade³⁸ and can use multiple earth station sites, separated by several miles, to avoid the localized impact of heavy rain (which tends to be very local and intermittent).³⁹ Through using multiple

³⁵ CTIA Comments at 10-11; Ericsson Comments at 7; Nokia Comments at 12.

³⁶ CTIA Comments at 10-11 (noting the advantages of Ku-band transmission as compared to C-band and the benefits of antenna gain and adaptive Coding and Modulation in overcoming rain fade).

³⁷ Verizon Comments at 17.

³⁸ See, e.g., Jalal J. Hamad Ameen, Rain Effect on Ku-Band Satellite System, 4 Int. Journal of Electrical and Electronics Engineering, No. 2 at 14 (May 2015) (comparing Ku-band and C-band systems in the context of rain fade and finding that rain fade “can be mitigated, however, by deploying an appropriate link budget strategy when designing the satellite network, and allocating a higher power consumption to compensate rain fade loss.”), at <http://wireilla.com/engg/eeeij/papers/4215elelij02.pdf> (last visited Nov. 13, 2017).

³⁹ See, e.g., Recommendation ITU-R P.618-7, “Propagation data and prediction methods required for the design of Earth-space telecommunication systems,” at 2.2.4 (“Intense rain cells that cause large attenuation values on an Earth-space link often have horizontal dimensions of no more than a few kilometres. Diversity systems able to re-route traffic to alternate earth stations, or with access to a satellite with extra on-board resources available for temporary allocation, can improve the system reliability considerably.”), at https://www.itu.int/dms_pubrec/itu-r/rec/p/R-REC-P.618-7-200102-S!!MSW-E.doc (last visited Nov. 15, 2017)

bands, link budget management, site diversity, and other mitigation techniques, operators can minimize the probability of rain fade interfering with their satellite reception.⁴⁰

The Commission should urge users to consider fiber as an alternative to FSS in areas with nearby fiber deployment, as many commenters suggest.⁴¹ Fiber is not a viable substitute for satellite service in all cases but, with the concentration of FSS earth stations in urban and suburban areas, the Commission should consider whether providing incentives for users to transition to fiber could substantially ease sharing or clearing of the band, regardless of the chosen mechanism. And the Commission should permit new entrants to provide fiber replacements for incumbent satellite systems, just as it did when PCS licensees relocated fixed microwave incumbents from the 2 GHz band.⁴²

C. Future high capacity video transmissions will require additional bandwidth.

The American Cable Association's (ACA) claim that future 4K transmissions will stretch capacity demands beyond existing system capabilities supports our view that the Commission should consider shifting C-band users to the Ku-band or fiber. The ACA notes that C-band satellites currently carry two thousand channels of programming, that "[w]ith the upgrade of resolution quality to 4K, the demand for the C-band will soon handily exceed the satellite capacity available today,"⁴³ and that "the advent of higher video resolution means that the C-

⁴⁰ *Id.*

⁴¹ See T-Mobile Comments at 14; CTIA Comments at 11; Ericsson Comments at 7.

⁴² See *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, ET Docket No. 92-9, First Report and Order and Third Notice of Proposed Rulemaking, 7 FCC Rcd 6886, 6889 ¶ 19 (noting that the Commission believes that fiber is a viable alternative for spectrum and encourages consideration of fiber use where practicable).

⁴³ Comments of American Cable Association, GN Docket No. 17-183 (filed Oct. 2, 2017) at 2 ("ACA Comments").

band traffic jam will be exacerbated even assuming the replacement of the entire existing fleet.”⁴⁴ The Ku-band and fiber are thus better suited for high capacity video transmissions since they have greater bandwidth and capacity available to support growing video demands. As an MVPD, Verizon recognizes the importance of reliable delivery of video content to its head-ends. For example, to reduce cost, rather than build a headend in each market, we built two “super” headends to receive our satellite signals and use fiber to distribute the feeds to each sub-tending market. The record supports market approaches to quickly facilitate beneficial use of the 3.7-4.2 GHz band.

Given the potential value of the 3.7-4.2 GHz band for 5G, Verizon encourages quick action to make the band available for mobile deployment. In addition to moving swiftly to an NPRM for flexible use in the band, the Commission should begin considering the most efficient and expedient mechanism for ensuring that the spectrum is put to its highest and best use.

In other bands, the Commission has had great success clearing spectrum and repurposing it via auction. But the Commission’s typical auction approach would require a protracted process spanning several years. As Federated Wireless states in its comments, “a conventional ‘clear and auction’ approach to the 3.7-4.2 GHz band will only serve to ensure that 5G services are not deployed in the band before the end of the decade.”⁴⁵ Unfortunately, the race to 5G and exponentially growing consumer demands do not offer the luxury of a process lasting several years.

⁴⁴ *Id.* at 15.

⁴⁵ Federated Wireless Comments at 5.

A diverse set of commenters, representing a range of interests and industry sectors, rightly urges the Commission to consider relying on market forces to repurpose the band.⁴⁶ Given the opportunity and removal of certain regulatory barriers, the market incentives can quickly align the interests of incumbents and new entrants to enable the more economically beneficial use of mid-band spectrum on a timeline consistent with the U.S.'s 5G needs.

V. THE COMMISSION MUST ENSURE THAT UNLICENSED USE IN THE 6 GHZ BAND DOES NOT INTERFERE WITH EXISTING OR FUTURE MICROWAVE SYSTEMS.

The record supports the Commission moving forward to explore using 500 megahertz of mid-band spectrum in the 5.925-6.425 GHz band for unlicensed use.⁴⁷ Many commenters agreed with Verizon that any consideration of expanded access to this band must be contingent upon the Commission adopting rules that provide adequate protections to incumbent and future microwave deployments.⁴⁸ We look forward to exploring fully any mitigation techniques that unlicensed stakeholders propose. The burden of demonstrating that unlicensed services will not interfere with current or future incumbent use of the 6 GHz band must rest solely on the unlicensed industry, be assessed in an open and transparent process, and permit the full participation of incumbents.

VI. CONCLUSION.

The Commission must take bold action to preserve America's 5G leadership. With only the experimental 3.5 GHz band available in the mid-band spectrum pipeline, the nation's mid-

⁴⁶ See *e.g.*, TIA Comments at 4; Joint Intel Comments at 2-3; Letter from Harold Feld, SVP Public Knowledge, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 17-183 (filed Oct. 2, 2017) at 3.

⁴⁷ See *e.g.*, T-Mobile Comments at 16-17; Ericsson Comments at 9.

⁴⁸ See Verizon Comments at 21-22; T-Mobile Comments at 16-17; and Ericsson Comments at 9.

