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

In the Matter of	)	
	)	
Expanding Flexible Use of the	)	GN Docket No. 18-122
3.7 to 4.2 GHz Band	)	
	)	
Petition for Rulemaking to Amend and Modernize	)	
Parts 25 and 101 of the Commission's Rules to	)	
Authorize and Facilitate the Deployment of	)	RM-11791
Licensed Point-to-Multipoint Fixed Wireless	)	
Broadband Service in the 3.7-4.2 GHz Band	)	
	)	
Fixed Wireless Communications Coalition, Inc.,	)	RM-11788
Request for Modified Coordination Procedures in	)	
Band Shared Between the Fixed Service and the	)	
Fixed Satellite Service	)	

COMMENTS OF DYNAMIC SPECTRUM ALLIANCE

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INTRODUCTION AND SUMMARY

The Dynamic Spectrum Alliance ("DSA")[1] welcomes the Federal Communications Commission's Notice of Proposed Rulemaking on the 3.7 to 4.2 GHz band ("NPRM").[2] Improving the rules that govern this band can position companies nationwide to employ advances in wireless technology and state-of-the-art spectrum sharing techniques to use this band to deliver broadband to more Americans in more places than ever before possible. As the NPRM observes, this would help the Commission address America's ever-increasing wireless broadband needs, connect rural and underserved communities, and advance U.S. leadership in 5G deployment.[3] In addition, "the band is ripe to meet [the Commission's] mandate under the MOBILE NOW Act to identify (with NTIA) 255 megahertz of spectrum for mobile and fixed wireless broadband use."[4]

To achieve these goals, DSA recommends that the Commission: (1) permit fixed point-to-multipoint operations throughout the band, (2) amend the outdated full-band, full-arc coordination regime, and (3) assign new flexible-use licenses through an auction rather than delegating assignment to a private administrator engaging in opaque individual transactions.

Supporting fixed point-to-multipoint operations. The Commission contemplates creating three sub-parts of the 3.7 to 4.2 GHz band. A lower section would contain new flexible-

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1 The Dynamic Spectrum Alliance is a global, cross-industry alliance focused on increasing dynamic access to unused radio frequencies. The membership spans multinational companies, small- and medium-sized enterprises, academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the utilization of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members/.

2 *See Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, FCC 18-91 (rel. July 13, 2018) (NPRM).

3 NPRM at ¶3.

4 *Id.* at ¶ 53.

use licensees. A middle section would contain FSS licensees that may in the future relocate to allow for additional flexible-use licensees. And, an upper section would contain remaining FSS licensees. There will be unused frequencies in each of these sections in many parts of the country. Fortunately, spectrum-sharing mechanisms allow for rules that would empower fixed operations to use these frequencies without causing harmful interference to flexible-use or FSS licensees. Such operations could be governed by a dynamic spectrum sharing database management mechanism, allowing for adoption of the NPRM's proposal to permit fixed point-to-multipoint operations. This mechanism would ensure that unused spectrum resources are not wasted and strengthen fixed licensees' ability to use the band to expand broadband service.

Amending the full-band, full-arc coordination regime. The NPRM proposes to replace the outdated full-band, full-arc coordination policy with a more reasonable system in which FSS licensees will be entitled to protection only for those frequencies, azimuths, and elevation angles that they report as being in daily use. The Commission should adopt this proposal, which will advance spectral efficiency, allow more intensive terrestrial use of the band, and protect actual FSS operations instead of blocking unnecessarily large spectral and geographic areas.

Assigning flexible-use licenses. Finally, the Commission should not delegate assignment of new flexible-use licenses to a private administrator that would oversee a set of opaque individual transactions. Delegation to a private administrator would lead to a loss of revenue for the U.S. Treasury, likely lead to decisions that sacrifice the national goal of maximizing efficiency and overall utility to the pursuit of individual advantage for the private administrator or specific FSS licensees, and place governance of a valuable national spectrum resource into a system of private deals beyond Commission oversight. Furthermore, such an

unusual and risky change from the Commission's long-standing tradition of spectrum auctions should not be undertaken without explicit Congressional approval.

I. Fixed Point-to-Multipoint Operations Should Be Permitted Throughout the Band in the Absence of Harmful Interference to FSS or New Flexible-Use Licensees.

The Commission's central goal in this proceeding is to increase the efficiency and intensity of use of the 3.7 to 4.2 GHz band. To do so, the NPRM would create three sections of the band: (1) a lower section containing new flexible-use licensees, (2) a possible middle section containing FSS operations that could in the future convert into use by additional flexible-use licensees, and (3) an upper part containing remaining FSS licensees. This approach would improve efficiency, but still leave frequencies unused in communities across the country.

The Commission recognizes that use of such unused frequencies by fixed operations would increase the intensity of use of the band, and the NPRM proposes to allow fixed operations to share a portion of the band with FSS licensees. Spectrum sharing enables greater flexibility in spectrum management and more efficient use of limited spectrum resources. Through appropriately crafted technical and operational rules, the same spectrum band could be able to support multiple radiocommunication services, rather than exclusively (and inefficiently) supporting a single service.[5] DSA therefore supports spectrum sharing through static and dynamic means, wherever and whenever possible without causing harmful interference.

Furthermore, the Commission wisely recognizes the promise of state-of-the-art radio technologies by proposing to permit fixed point-to-multipoint operations. Point-to-multipoint operations allow broadband providers to reduce the cost of deploying networks through the use of radio hubs that can complete fixed links with multiple endpoints, avoiding an expensive

[5] Spectrum sharing can be based on time separation, frequency separation, spatial location separation, signal separation, or combinations thereof. Where required, sharing can also be facilitated by a dynamic database, the application of which in the 3.7-4.2 GHz band is discussed herein.

network architecture that would require different individual transceivers to serve each endpoint. DSA agrees with the Commission that at a minimum "regardless of how much spectrum becomes available for flexible use in the near term,"[6] it is feasible and desirable to authorize P2MP fixed wireless to "operate on a secondary basis *vis-à vis* FSS in any part of the band in which FSS continues to operate during a transition period to accommodate repacking and, thereafter, on a frequency-coordinated basis to protect actual FSS operations."[7]

The Commission could improve overall efficiency by expanding the frequencies on which broadband providers can deploy fixed point-to-multipoint operations to include the lower part of the band (which would house new flexible-use licensees) and the middle part of the band (which may house FSS licensees but could in the future house additional flexible-use licensees). These bands, like the upper band, would include frequencies in many parts of the country in which no licensee would operate, allowing for accommodation of fixed service that would not cause harmful interference. By combining the approach of clearing FSS in favor of flexible use licensing at the bottom of the band with the certification of a dynamic spectrum management database system to enable shared access to unused spectrum by fixed wireless across the entire band, the Commission can make every unused megahertz of spectrum in the 3.7-4.2 GHz band available for 5G terrestrial deployments, both mobile and fixed.

A. The Commission Should Replace Manual Coordination in the 3.7-4.2 GHz Band with a Dynamic Spectrum Management Database System.

The Commission should act rapidly to replace the system of manual expedited coordination (mandatory electronic notification and response) with an fully automated dynamic spectrum management database system. The Commission should delegate development of the

6 NPRM at ¶ 119.

7 *Id.* at ¶ 116.

database to a representative group of industry stakeholders, such as the WinnForum, which has hosted the private sector process of developing the technical implementation of automated coordination and interference avoidance for the CBRS band. The ultimate certification of one or multiple database systems for the 3.7-4.2 GHz band could speed coordination times, lower coordination costs, protect incumbents from interference with greater certainty, and reduce the burden on Commission staff. Most importantly, it could facilitate more intensive use of unused spectrum across the entire band in underserved areas.

Although DSA members have developed and will be operating Spectrum Access Systems ("SAS") in the neighboring CBRS band, nothing as complex as the SAS is needed to coordinate fixed operations in the 3.7-4.2 GHz band. Google, for example, has proposed an automated but "lightweight" database authorization system that "would modernize the manual coordination process that is now codified in Part 101 of the Commission's rules."[8] Assuming that FSS incumbents would need to retain flexibility to switch or add transponders, a more dynamic frequency management database system, combined with a requirement that equipment be operable across the entire 3.7-4.2 GHz band, would better ensure that C-band operations have the flexibility to switch transponders or frequencies quickly, as necessary, and that fixed operators can accommodate the changes.[9]

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[8] Comments of Google LLC at 9, GN Docket No. 18-122 (filed May 31, 2018) ("Google Mid-Band NOI Comments"). Several other parties also supported an automated coordination database in response to the Commission's Mid-Band NOI. Reply Comments of the Broadband Access Coalition at 4, GN Docket No. 18-122 (filed June 15, 2018) (proposing to automate the existing Part 101 coordination process) ("Comments of BAC"); Comments of Frontier Communications Corp., Windstream Services, LLC, and Consolidated Communications, Inc. at 7-8, GN Docket No. 17-183 (filed Oct. 2, 2017) ("the BAC proposal builds on a well-understood, existing framework, Part 101, and [would] make the framework readily updateable, whether through a future electronic coordination system or a spectrum access"); Comments of Microsoft Corporation at 9, GN Docket 17-183 (filed Oct. 2, 2017) ("the Commission should require the [Part 101] coordination process to be automated through a database in relatively short order after the new service is authorized through a multi-stakeholder process").

[9] *See* Comments of the Broadband Access Coalition at 6, GN Docket No. 17-183 (filed Oct. 2, 2017). "In the event the FSS earth station needs to temporarily or permanently change frequencies or point at a different

B. The Commission Should Permit Fixed Point-to-Multipoint Operations to Share the Upper Part of the Band with FSS Operations.

Fixed point-to-multipoint systems can bring otherwise unused frequencies into use by coordinating operations so as not to cause interference to co-channel FSS systems.[10] Interference calculations to permit FS-FSS sharing in the band would be particularly straightforward because the locations of both earth stations and proposed point-to-multipoint fixed deployments would be geographically fixed and their operational parameters well known. The directional nature of fixed point-to-multipoint radios permits the coordination of sectors even where earth stations are in the same geographic area but located outside the beam of the base station and the client device return path. The arc of the sector can be variable and based on antenna beamwidth, as adjusted to conform to the arc that could be successfully coordinated. The radius of the sector should be specified and its maximum could be different in rural and more densely populated areas.[11] In more complex situations, individual base stations and user nodes could be coordinated through the Commission to ensure they do not cause harmful interference.

Point-to-multipoint fixed operators could most readily coordinate sectors to enable deployments serving a cluster of homes, or scattered sites in a local area, on a non-co-channel basis, using frequencies that nearby earth stations are not using. This approach is particularly promising in rural areas where earth stations are less numerous and more widely dispersed.[12]

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position on the arc, the satellite operator would be required to update the database, and potentially interfering terrestrial uses could be relocated to new frequencies as determined by the frequency coordinator." *Id.* at 8.

[10] *See* Letter from Stephen E. Coran, Counsel to the Wireless Internet Service Providers Association, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 17-183 and RM-11791 (filed Mar. 29, 2018) ("Google/BAC Technical Presentation"), *available at* https://ecfsapi.fcc.gov/file/10329174176162/Notice%20of%20Ex%20Parte%20Meetings%20-%20Broadband%20Access%20Coalition%20and%20Google%20LLC.pdf.

[11] NPRM at ¶ 120.

[12] Based on matching registered earth station locations reported in IBFS with the National Land Cover Database, Google found that "approximately half of the FSS 4 sites are in urban areas, one-third are in rural areas, and

Moreover, a majority of earth stations receive content from at most a few transponders that together use only a small portion of the band's 500 megahertz.[13] As explained below, this underlies the proposal to end the practice of full-band, full-arc reservation of frequencies that are not actually in use.

While more unused capacity would be available on a non-co-channel basis, the coordination of co-channel sharing between FSS and fixed point-to-multipoint service also would be possible, particularly in rural and remote areas. The coordination of co-channel sharing by fixed point-to-multipoint operations would be possible in areas without any nearby earth stations, or by using directional antennas that point away from earth stations and create short enough links not to raise the risk of interference to FSS.[14] For example, the real-world fixed deployment on the Monterey Peninsula undertaken by Google and Mimosa Networks illustrated the feasibility of extensive sharing by taking advantage of antenna directionality and other methods to avoid harmful interference, even to nearby earth stations operating co-channel.[15]

As discussed above, to improve the efficacy and efficiency of coordination, the Commission should permit fixed operators to use a dynamic spectrum management database

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17% are in suburban areas." Comments of Google LLC and Alphabet Access at 6, GN Docket No. 17-183 (filed Oct. 2, 2017), ("Google Mid-Band NOI Comments").

[13] Letter from Adam Shoemaker, Counsel, National Public Radio, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket No. 17-183 (filed Nov. 8, 2017) ("NPR Ex Parte"). Similarly, as of June 2017, the 975 earth stations registered to the Associated Press used 23 megahertz on a single transponder below 3900 MHz. Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3700-4200 MHz Band, Petition for Rulemaking, RM-11791, 22 & note 42 (filed June 21, 2017) ("*BAC Petition*").

[14] Comments of the Open Technology Institute at New America et. al. at 28, GN Docket No. 17-183 (filed Sept. 11, 2018).

[15] *See* Google/BAC Technical Presentation at slides 23-41.

system instead of requiring only use of manual coordination. The traditional Part 101 coordination manual process is outdated and needlessly slow, costly, and cumbersome. Furthermore, in the new band sharing environment, point-to-multipoint fixed applicants should be subject to an "expedited coordination process with mandatory electronic notification and response."[16] While the Commission should support development and use of such a system with low-cost and near-real-time response rates to coordination requests, it should not delay deployment in underserved areas while testing and certifying database systems. The Commission should begin by updating the Part 101 coordination system for fixed operations in this band to permit prior coordination through an online IBFS portal that facilitates mandatory electronic notification and response of relevant parties on an expedited basis, thereby shortening any prior coordination waiting period. To the extent an individual customer location requires prior coordination, the notice and response period should be a matter of days, not weeks.

The NPRM also asks if "point-to-multipoint FS applicants [should] be required to submit frequency coordination for each access point" and, in addition, coordinate devices at customer locations (e.g., residences).[17] A database with up-to-date IBFS location and operational data could quickly and inexpensively verify the coordination of any transmit point—including individual client locations—within the sector initially coordinated by a point-to-multipoint operator. Requiring a coordination analysis before deployment at each point served would enable coordination of more sites overall, because it would not require *every* location in a sector to be able to satisfy a prior coordination analysis. For example, the fact that a few elevated

[16] NPRM at ¶ 123.

[17] NPRM at ¶ 122.

locations in a sector cannot be coordinated should not preclude service to dozens of other homes and businesses at locations that could be coordinated.

While the prior coordination of each transmit point should be done by an automated database system, this point-based coordination could be implemented initially by a manual (or database-assisted) coordination process if the Commission provides for an online portal with electronic notification to any potentially impacted FSS or fixed licensee. Importantly, while a point-based interference analysis could be justified for customer locations and retained in case future problems arise, there should be no separate Commission application requirement or regulatory fee for client devices within the coordinated sector.

Fixed operators could also serve more locations with a higher quality of service if the Commission authorizes coordination using propagation models that account for the real-world clutter that attenuates terrestrial signals and mitigates potential interference. As Google previously observed, the propagation of fixed services at 3.7 GHz is heavily impacted by clutter such as buildings and trees, with usable signal range limited to as few as several hundred meters when the propagation path is contained within the clutter layer.[18]

A fixed deployment designed to serve multiple homes along a residential street could take advantage of directional antennas and low elevation to keep its signal in the clutter—and should be encouraged to do so. "[K]eeping the signal path below the treetops and rooftops in the area will, in practice, dramatically reduce the potential interference to FSS earth station outside the immediate area, compared to expectations of interference based on non-clutter models such

[18] Google Mid-Band NOI Comments at 7-8.

as Longley-Rice."[19] In urban areas, buildings can block fixed broadband access ("FBA") signals, while FSS antennas on rooftops would be shielded from street-level FBA systems.

C. Fixed Point-to-Multipoint Licensees Should Be Allowed to Share the Lower Portion of the Band with New Flexible-Use Licensees, and the Middle Portion of the Band with FSS or Future Flexible-Use Licensees.

An automated database system could also facilitate the coordinated use of unused spectrum capacity not only in the upper FSS portion of the band, but across the entire 3.7-4.2 GHz band, including in any lower or middle segments of the band that could eventually be cleared, reassigned, and later deployed by mobile operators.

Whether the Commission relies on a private administrator or a public auction, a substantial portion of the band above 3.7 GHz would be cleared of FSS incumbents and reallocated to flexible use licensing. However, licensing and the ultimate buildout of the anticipated mobile carrier networks over rural and other less densely populated areas would take many years—potentially even longer than the initial license terms if buildout requirements are significantly less than 100 percent of the population. During this period, the same automated frequency management database system that could facilitate faster, more efficient, and lower cost coordination between fixed service and FSS in the upper segment of the band could be used to govern opportunistic access, on at least a temporary basis, by fixed services in vacant lower band frequencies until future licensees commence service.

With the benefit of the geographic database, the Commission could once again adopt the same "use it or share it" approach already adopted for GAA use of vacant PAL spectrum in the CBRS band and for unlicensed use of locally vacant flexible use spectrum in the post-incentive-auction 600 MHz band. Commission rules should require fixed access points deployed

[19] *Id*. at 7.

opportunistically in the band to query the database, which would only permit placement of a fixed link in an area where a new flexible-use licensee has not begun service. Fixed service licensees should be required to periodically re-check the database to determine whether any new flexible-use licensee has initiated operations in a previously unused location, and the database should be required to revoke any permission to operate, or require a change in the transmit power or other operational condition, based on this new information.[20]

Furthermore, re-organization may produce a middle section of the band that would at first continue to house FSS operations but may be cleared for flexible-use licensees in the indefinite future. There also would be unused spectrum in this segment for many years, particularly in rural and other less populated areas. The Commission should authorize fixed operations to coordinate use of this middle portion of the band on an opportunistic basis (e.g., licensed by rule), subject to database control and revocable permission to continue operating. This coordination process would be no different than in the upper band segment, except that—as in the lower segment—the database system would be able to revoke the permission to operate, or require a change in operating conditions, as needed to protect and ultimately transition from FSS to deployments of a future flexible-use licensee.

II. The Outdated Full-Band, Full-Arc Coordination Regime Should Be Amended.

The current coordination policy for FSS earth stations operating in the 3.7-4.2 GHz band should be changed. Under the current rules, "prior to filing an application to register or license with the Commission, [an applicant] must coordinate its proposed frequency usage with existing terrestrial users and with applicants that have filed for terrestrial station authorizations."[21] Under

[20] NPRM at ¶ 119.
[21] NPRM at ¶ 37.

current rules, C-band earth stations are "generally coordinated and authorized to use the entire band across the full geostationary arc, a policy known as full-band, full-arc."[22]

This practice requires review "in light of [the Commission's] goal to maximize spectrum efficiency and use in the 3.7-4.2 GHz band including more intensive terrestrial use of the band."[23] The Commission has proposed to change the system so that:

> Earth station operators will be entitled to protection only for those frequencies, azimuths, and elevation angles and other parameters reported as in regular use (i.e., at least daily) in response to future information collections, until the incumbent starts the coordination process for an application to modify its license or registration in IBFS for its earth station. We further propose that such modification applications identify and include a coordination report for the specific combinations of frequency, azimuth, and elevation angle that the incumbent intends to use and that such technical information be reflected on the earth station application and authorization.[24]

This improvement is necessary. The current policy is extremely spectrally inefficient because it blocks shared uses of the band based on the possibility that an earth station may one day need to switch between transponders or between satellites rather than basing coordination on actual use. For example, the Associated Press's 975 receive-only C-band earth stations are all fixed on a single transponder using just 23 megahertz of spectrum.[25] National Public Radio's 475 earth stations use four satellite transponders that transmit between 3702-3858 MHz.[26] But the current policy leads to coordination analysis that assumes both of these licensees use full band and full arc. Consequently, despite the fact that large portions of the band are unused by

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22 *Id.*

23 *Id.* at ¶ 39.

24 *Id.* at ¶ 38.

25 BAC Petition at 22.

26 NPR Ex Parte at Attachment p. 5-6.

these licensees, new providers would nevertheless have to coordinate with existing licensees as if they used the entire 500 MHz along the entire geostationary arc from the earth station location.

FSS licensees argue that this over-protective system is necessary to account for the chance that they will need to switch transponders or frequencies at some point in the future. But the Commission does not need to maintain the extreme full-band, full-arc coordination system to permit such changes. An automated spectrum management database would provide flexibility to FSS operations while still enabling vastly greater use of the band. Commission rules already provide for similar databases in more complicated and dynamic spectrum sharing environments, such as the CBRS and broadcast television bands. The Commission is also considering the use of spectrum databases to support sharing in the 6 GHz and 37 GHz bands. Existing database technology can support coordination analyses of FSS operations, including changes to transponder and frequency use, making use of full-band, full-arc system unnecessary and wasteful.

III. New Flexible-Use Licenses Should Be Assigned Through an Auction Instead of a Private Administrator.

DSA participates in proceedings worldwide to advance spectrum-sharing policies that improve spectrum efficiency and promote innovation wherever possible. In some situations spectrum sharing is not currently possible, and the best way to advance efficiency and intensity of use is for a regulator to reallocate a band to a flexible-use allocation. Regulators around the world have learned from the Commission's successes that spectrum auctions are the best method of assigning spectrum rights when spectrum sharing is not possible. Reliance on beauty contests or opaque mechanisms prevent countries from benefiting from auction revenues, interfere with transparency and public oversight, and too often lead to legal challenges.

The Commission should use an auction in portions of the band where it decides to clear FSS incumbents to assign licenses rather than delegating assignment responsibilities to a private administrator that would seek and execute individual transactions. In seeking comment on untested private-administrator schemes, the Commission is right to ask about oversight and safeguards that a consortium of FSS operators entrusted to clear the lower segment would require.[27] Put simply, reliance on a private "transition facilitator" raises serious policy concerns.

Such an approach should be rejected. First, a private transaction in all likelihood will not include opportunistic sharing between fixed point-to-multipoint and flexible-use licensees. But an auction could condition licenses on complying with a use-or-share requirement similar to the one the Commission adopted for the CBRS band. In fact, the parties to private transactions would have a disincentive for allowing opportunistic sharing in the planned flexible-use portion of the band if they believe it will reduce the transaction price for the seller, even if it increases the intensity of use of the band, especially in rural areas. The Commission, however, takes a view of the benefits the entire country rather than only to individual companies. Increasing the availability of broadband in unserved and underserved areas through point-to-multipoint fixed broadband systems and having a more spectrally efficient flexible-use band through opportunistic sharing both advance this larger good.

Second, eschewing an auction for a private administrator would result in a loss of auction revenue for the U.S. Treasury. Auctions are a proven "market-based means of repurposing much-needed spectrum for flexible use."[28] If the lower segment of 3.7-4.2 GHz band is cleared and repurposed through an auction, the U.S. Treasury would receive most of the auction

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[27] NPRM ¶ 86.

[28] *See* Federal Communications Commission, Media Wireless Telecommunications, Incentive Auctions FAQs, https://www.fcc.gov/general/incentive-auctions-faqs (last visited Oct. 29, 2018).

proceeds, which by some estimates could be billions of dollars. A portion of the auction proceeds could be used to create a relocation fund to compensate the affected earth station and FSS operators for relocation and cost recovery, or provide the technical assistance needed for relocation. A private transaction facilitator supported by a subset of licensees, especially with financial incentives not aligned with the public interest, may (and would have every market-based incentive to) preferentially direct those billions of dollars to a small number of FSS operators and their shareholders. A spectrum auction would remove this risk.

Third, private transactions directed by a private administrator would not be as market-based as an auction. With the right rules, an auction would ensure that spectrum is allocated for the most valued use. On the other hand, clearing by a private transition facilitator would not be market driven. A transition facilitator supported by a subset of global C-band operators would seek to serve the narrow interests of those operators. It would have the incentive, for example, to maximize profit for those licensees (e.g., negotiating to reduce payments to FSS licensees that do not elect to participate) or reduce the supply of spectrum to drive up prices (especially if the administrator's compensation is based on total transaction revenues rather than total spectrum freed for use). Furthermore, the transition facilitator's incentive to monetize the band will reduce its incentive to open the band for near-term sharing during the transition period, which could block fixed deployments to serve rural and other underserved areas. While a private transaction approach to clearing could result in a tremendous windfall for a handful of C-band operators and the administrator, an auction would better serve the Commission's wider responsibilities.

Fourth, private negotiations are opaque by their nature and could potentially result in "sweetheart deals" antithetical to the Commission's goals. Entrusting clearing to a transition facilitator risks effectively limiting access to the band to a handful of companies conducting

private negotiations. While Commission auctions are designed to ensure that as wide a set of potential bidders can participate as possible, a single transition administrator arranging individual negotiations would impose higher transactions costs. This would benefit the largest and most well-funded purchasers, rather than the wider array of businesses and entities that would have equal chance to win spectrum in an auction. Furthermore, without Commission involvement and oversight, there would always be a temptation by negotiation participants to collude, enter into side agreements, or engage in other behavior to maximize individual financial gain or minimize potential competition, rather than advancing the public interest. Use of a private administrator would raise questions about whether outcomes are in the country's interests, especially with regard to access of other "buy-side" potential stakeholders to the band and the ability of the public to determine how spectrum resources are being assigned. The Commission has historically relied on auctions to address these challenges.

Fifth, delegation to a private administrator does not assure faster deployment than assignment through an auction. The NPRM states "[a] secondary market approach might make spectrum available more quickly than other available mechanisms, such as an Commission auction, and thus could facilitate rapid deployment."[29] However, as stated above, a process that shuts out potential participants, reduces government revenue to zero, and creates incentives to maximize profits for a subset of companies while minimizing payment to remaining FSS licensees, invites lengthy litigation. The Commission learned this lesson in the pre-auction era, when license assignments were often stuck in legal challenges for years, leading it to adopt the transparency and certainty of auctions. The Commission should include this risk in its calculations of the real-world time-to-deployment associated with the untested private

[29] NPRM ¶ 67.

administrator. As noted, the Commission has a more reliable opportunity to expand broadband service rapidly (especially to underserved and rural Americans) in the entire 500 MHz of the band by allowing immediate fixed deployments while the broader introduction of flexible-use licensees is in process.

Sixth, the Commission should not depart from its long-standing tradition of spectrum auctions for reliance on a private administrator without explicit Congressional approval. When the Commission proposed to clear UHF channels in advance of the 700 MHz spectrum auction, Congress had a different idea. Subsequently, when Congress developed legislation to repurpose the 600 MHz band, it required the Commission to conduct an auction. Congress could have relied on private negotiations between mobile operators and TV broadcasters to repurpose certain markets sooner than others, but did not. Here, with potentially enormous auction revenues at risk, transparency and oversight challenges, and an untested theory that a private administrator could stand in the Commission's place in assigning spectrum rights, the Commission should seek Congressional authorization prior to acting.

IV. Conclusion.

With the right rules in place, the 3.7-4.2 GHz band can support more robust and productive wireless service by flexible-use, FSS, and fixed point-to-multipoint service providers. The right Commission decisions will maximize the utility of the band, allow providers to use every available megahertz rather than allowing spectrum unnecessarily to sit fallow, and produce transparent assignment of new licenses that advance the country's goals rather than benefit a small group of companies. DSA therefore urges the Commission to: (1) permit fixed point-to-multipoint operations throughout the band, governed by a dynamic spectrum access database system, (2) replace the outdated and unnecessary full-band, full-arc coordination system with a

system that coordinates based on actual use, and (3) assign new flexible-use licenses through an auction.

Respectfully submitted,

/s Kalpak Gude

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October 29, 2018