Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

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

REPLY COMMENTS OF DYNAMIC SPECTRUM ALLIANCE

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November 15, 2017

I. INTRODUCTION AND SUMMARY

As we stated in our Comments in this very important proceeding, the Dynamic Spectrum Alliance ("DSA")[1] believes that it is critical for the Federal Communications Commission ("FCC" or "Commission") to identify new mid-band spectrum to meet the growing demand for wireless broadband. The Commission has led the world in embracing state-of-the-art spectrum sharing techniques, including unlicensed spectrum, to facilitate more efficient use of spectrum through its efforts in Television White Space ("TVWS") and the Citizens Broadband Radio Service ("CBRS") proceedings. If the disparate Comments in this proceeding suggest any common viewpoint regarding spectrum management, it is that efforts to find new spectrum for broadband will require new approaches that balance the needs of incumbent service providers and their customers, with the needs for new broadband spectrum to satisfy the ever growing demand for wireless services.

The DSA believes that the FCC must continue its global leadership role and make dynamic spectrum sharing part of the normal spectrum management toolkit to unlock unutilized spectrum and more efficiently use spectrum resources on a going-forward basis. Although traditional licensed approaches to spectrum management are sometimes useful when spectrum can be cleared, and when the propagation characteristics of the spectrum benefit from such approaches, the DSA believes that a balanced approach to spectrum management between

[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/ .

licensed, unlicensed, and lightly-licensed spectrum management is critical to satisfy the spectrum demands for broadband services, as well as the other spectrum users.

As DSA stated in our Comments in this proceeding, incumbent services, particularly in the 3.7-4.2 GHz and 6 GHz bands, provide important and valuable services that cannot easily be moved to vacate the bands. Efforts to do so would take many years without any certainty for success. As the demands for additional spectrum for broadband services grows each year, uncertainty and delay will not only be counterproductive to broadband deployment, but also will stifle the economic growth and jobs that are both directly and indirectly related to the our modern digital economy.

DSA recommends that the Commission issue a Notice of Proposed Rulemaking ("NPRM") that proposes to (1) authorize dynamic shared access to the 3.7-4.2 GHz band and to update the licensing database for this band; and (2) permit unlicensed operations from 5.925-7.125 GHz using sharing mechanisms to protect incumbent services while still unlocking the significant unutilized spectrum in the band.

II. THERE IS STRONG SUPPORT FOR IMMEDIATE EXPANSION OF SHARED ACCESS TO THE GROSSLY UNDERUTILIZED 3.7-4.2 GHz BAND

DSA fully supports the early authorization of more intensive and dynamically shared access to the 3.7-4.2 GHz band, whether or not the band can be reallocated in the long-term for mobile or other new services. The record shows a clear consensus among most commenters on at least three points:

First, although there is widespread and important usage of the 3.7-4.2 GHz band by incumbent Fixed Satellite Service (FSS) earth stations and operators, the overall capacity of the band is grossly underutilized. Dynamic spectrum sharing mechanisms can end the wasteful "full-band, full-arc" reservation of the entire 500 megahertz, and facilitate more intensive utilization of the band, while still preserving the ability of earth stations to switch transponders or add transponders that use a different frequency range on the band.

Second, the Commission should act expeditiously to update its IBFS database so that the agency can determine which earth station registrations should remain in effect, the accurate location of operating earth stations, and the frequencies and orbital slots that are in actual use by each earth station. Unregistered earth stations should be given a limited, but realistic, time to register and provide this same information if they desire to be protected from new entrants. The Commission should modify its rules to encourage registration of receive-only earth stations that are currently unregistered, including lowering the cost of doing so. The Commission should also create incentives for ensuring these registrations remain accurate in the future.

Third, although clearing FSS incumbents off all or even a substantial portion of the band is at best a long-term possibility, sharing of the band by terrestrial wireless operators on a localized basis, facilitated by an advanced Part 101 database coordination process that protects incumbent operators from harmful interference, is both feasible in the short-term and very much in the public interest. There appears to be no reason why *fixed and mobile* wireless operators cannot coordinate their actual deployments on fallow portions of the band using an updated and automated geolocation database under Part 101.

A. The Record Supports Shared Access to the Spectrum Left Fallow by 'Full-band, Full-Arc' Reservations by FSS Incumbents

There is no disagreement that FSS earth stations currently operate on only a portion of the lower C-Band's 500 megahertz – frequently using less than 10 percent of the band's spectrum – and yet they are presumed, under an ITU policy dating back to the 1960s, to reserve the "full band" and "full arc" at their location and within an enormous protection contour.[2] There is broad support in the record for ending the effective presumption that a registered earth station is occupying all 500 megahertz of the band, since it effectively warehouses spectrum that could be more intensively shared using, for example, advanced coordination mechanisms that protects FSS operators from harmful interference.[3]

The FSS industry and its customers (including content producers, MVPDs and broadcasters) generally oppose an end to full-band, full-arc reservations, arguing the ability of earth stations to switch transponders (and hence frequencies within the band) facilitate both service restoration and competition.[4] The American Cable Association (ACA) argues that ending

[2] *See, e.g.*, Comments of Nokia at 9 ("these criteria were self-derived by the FSS industry at the ITU decades ago, with little or no consideration of other services, and modern spectrum use and management."). Full-band, full-arc reservation is a policy that has never been codified.
[3] *See, e.g.*, Utilities Technology Council and Edison Electric Institute Comments at 12-14 ("current procedures are spectrally inefficient because new or modified FS links are not allowed to use fallow spectrum in the band even if there would be no harmful interference to any existing Earth-station operations") ("UTC/Edison Electric"); Comments of Microsoft Corporation at 3 ("FSS earth stations [should be] protected only to the extent necessary to protect them from receiving harmful interference"); Comments of the Broadband Access Coalition at 8 (hereinafter "BAC").
[4] *See, e.g.*, Comments of Satellite Industry Association at 28-29 (hereinafter "SIA"); Comments of the American Cable Association (hereinafter "ACA") at 18-19; Comments of the Content Companies at 6 (Walt Disney Company, CBS Corporation, Scripps Networks Interactive, Inc., Time Warner Inc., 21st Century Fox, Inc., and Viacom Inc.) (hereinafter "Content Companies").

full-band, full-arc coordination would lock receive-only earth stations into their current frequency bands (and satellite transponders), thereby limiting their ability to switch to different transponders (whether due to outage or for competitive reasons), or to add transponders.[5]

SIA, ACA and other FSS incumbents raise a valid point: *If* the Commission decides that FSS earth stations will continue operating between 3.7 and 4.2 GHz, then incumbents may need to retain the flexibility to switch transponders and/or add a transponder. This could, in turn, require the use of a previously vacant portion of the band that has become occupied by a new terrestrial licensee (whether fixed or mobile).

This concern by FSS incumbents is one important reason why DSA and some other commenters emphasized the need to condition enhanced sharing of the band on both an automated database coordination mechanism and a band-wide operability requirement. For example, the Commission requires such a mechanism for devices certified to operate in 3550-3700 MHz as part of the new Citizens Broadband Radio Service (CBRS), so that terrestrial users can shift frequencies, as necessary, to accommodate incumbents. Indeed, introducing a similar system in the 3.7-4.2GHz band would be less complex than CBRS due to the static nature of FSS and fixed wireless incumbents in the band. Although the Commission could certainly decide to "freeze" FSS incumbents – and deny earth stations preferential ability to switch or add transponders if needed – a dynamic Part 101 coordination system that preserves FCC licensing has proven feasible.

[5] Comments of ACA at 18-19.

Google, for example, proposes 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."[6] Similar to the coordination rules for CBRS, terrestrial wireless access points could be required to query the database periodically "to determine whether any new or deleted earth station registrations alter the FBA system's operational limits."[7]

The proposal by the Broadband Access Coalition (BAC) similarly anticipated the need to safeguard both the current and potential future spectrum use by incumbent FSS earth stations. BAC did so by proposing Part 101 coordination (including the development of a more automated and dynamic database-supported coordination system) and a requirement that point-to-multipoint (P2MP) operators certify equipment that is operable across the entire 3.7-4.2 GHz band. BAC recommended this approach specifically to accommodate the exigency that ACA, SIA and the Content Companies emphasize: the potential need for an earth station to add a transponder or switch between transponders that operate on a different portion of the band.[8]

The Commission should modify its policy to clarify that earth station licenses provide priority access and interference protection only for the specific frequencies (and orbital slots) on

[6] Comments of Google at 9. *Accord* Comments of Broadband Access Coalition at 4 (hereinafter "BAC") (proposing to use and automate the existing Part 101 coordination process); Comments of Frontier Communications Corp., Windstream Services, LLC, and Consolidated Communications, Inc. at 7-8 ("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 at 9 ("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").

[7] *Ibid*.

[8] Comments of BAC at 6. "In the event the FSS earth station needs to temporarily or permanently change frequencies or point at a different 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..", *Ibid*.

which satellite earth stations are actually operating. If the Commission agrees with FSS incumbents that some "reservation" of additional, vacant spectrum is justified, then the combination of database-supported coordination, a band-wide operability requirement, and a limit on the aggregate amount of spectrum at a location that can be coordinated for shared use by terrestrial wireless operators will, working together, ensure that the P2MP or other terrestrial user can switch frequencies to accommodate the FSS incumbent.

B. A Clear Consensus Favors an Immediate Updating of the IBFS Database, Including Any Information Needed to Promote Efficient Shared Use of the Band and Protection of Unregistered Earth Stations

There is a clear consensus in the record that the Commission should act expeditiously to update the IBFS database so that the agency can determine which earth station licenses should remain in effect, the accurate location of earth stations actually in operation, and the frequencies and orbital slots that are in actual use by each earth station. As Google/Alphabet Access argues, a "straightforward step toward more efficient use of the 3.7-4.2 GHz band … should be improving the existing database of C-Band FSS sites.[9]

Numerous commenters – including Nokia, Google, Microsoft, the Utilities Technology Council, and BAC – all agree that FSS earth station registration data grossly overestimates the usage of spectrum in the band due not only to the overbroad protections of "full band, full arc" reservations, but also because the information in the International Bureau Filing System (IBFS)

[9] Comments of Google LLC and Alphabet Access at 5 (hereinafter "Google"). *See also* Comments of BAC at 8-9.

is incomplete and badly out of date.[10] Google Earth imagery shows that approximately 29% of IBFS-registered C-band FSS locations are actually not in use for satellite services, despite being registered in IBFS.[11] In fact, 29% is a low estimate, since this does not include inactive dishes that remain in place.[12] As the Broadband Access Coalition argues, there is "overwhelming evidence" that many registered earth stations were never built, no longer exist, or operate at locations "far removed from those for which they were licensed."[13]

As DSA stated in its initial comments, the coordination of more intensive and efficient sharing of the band can be managed by an updated and more automated Part 101 coordination system. Because FSS and FS incumbents operations are static, this coordination can be automated using a spectrum management database, or possibly even an extension of the Spectrum Access System that will soon be deployed to manage access to the adjacent 3.5 GHz band (and which also protects FSS earth stations from adjacent channel interference).

Of course, any database-driven coordination system for terrestrial sharing with FSS operators will only be as effective as the quality of the earth station registration data. DSA therefore agrees with Google's view that "registrations that are not confirmed by a reasonable deadline should be deleted from IBFS and ineligible for interference protection."[14] Cleaning up the IBFS database and ensuring all stations are registered and reflect their actual geographic

[10] Nokia Comments at 6-8; Google and Alphabet Access Comments at 2 and 4-7; Microsoft Comments at 3; UTC/Edison Electric Comments at 14 (the Commission should "ensure that FSS licensees update the information in the ULS database"); BAC Comments at 8-9.
[11] Comments of Google at 4.
[12] *Ibid.* "It can confidently be said that approximately one-third of IBFS-registered C-band FSS sites *or more* do not require protection because they either do not exist or are not in operation." *Id.* at 5.
[13] BAC Petition at 22; Microsoft Comments at 3.
[14] Google and Alphabet Access Comments at 5-6 ("The Commission should require all operators of in-service C-band FSS sites to review their own IBFS registrations and certify that all registrations accurately reflect the geographic coordinates and receive frequencies of an active earth station, as well as the satellite orbital slots from which the active station receives signals.").

location will enable the Commission to accurately identify ways to share the C-band with point-to-point and point-to-multipoint broadband access and make the most efficient use of the spectrum.[15]

AT&T, which opposes a change to full-band, full-arc reservation, nevertheless agrees the Commission should conduct a "rigorous audit of C-band use."[16] Even the satellite industry has acknowledged the need for the Commission to update and improve the IBFS database. The Satellite Industry Association recently stated that a "clean-up" of the Commission's IBFS database is "appropriate to ensure its ongoing accuracy and completeness."[17] DSA supports SIA's suggestion that the Commission offer "amnesty" to earth station operators that provide accurate information on a timely basis in a manner specified by the Commission.[18]

An immediate updating of IBFS can also benefit FSS incumbents by ensuring that unregistered earth stations are protected from harmful interference.[19] The American Cable Association concedes that there are "thousands" of receive-only earth stations that are not registered with the Commission.[20] An update of the IBFS database should give unregistered

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[15] *Id.* ("Once the FSS registrations have been updated, IBFS will accurately reflect greater opportunities to share the C-band with point-to-point and point-to-multipoint broadband access . . . systems."). Nokia goes further, arguing the Commission should "ensure the decreasing use of 3.7-4.2 GHz band by FSS, by placing moratoria on new earth stations and on earth station renewals, unless the earth station applicant shows [t]hat C-band downlink is the only reasonable transmission path." Comments of Nokia at 12.

[16] AT&T Comments at 9.

[17] Opposition of SIA, RM-11791 (filed Aug. 7, 2017), at 8 ("However, conducting a one-time audit in which licensees are contacted and required to verify the operational status, coordinates, and elevation of their facilities may be warranted to ensure that any unbuilt or decommissioned facilities are removed from the database and any inaccurate site data is corrected.").

[18] *Ibid.*

[19] *See, e.g.*, Comments of SIA at 18 - 19, 22 – 24; Comments of American Cable Association at 4, n.4; Comments of National Association of Broadcasters at 3-4.

[20] American Cable Assn. Comments at 2-3. "If the Commission allows wider use of the band, it should preserve the primary status of the Fixed-Satellite Service, establish concrete, immediate-response enforcement mechanisms to avert interference, and explore a streamlined system for the *thousands of unregistered stations to become registered*." *Ibid* (emphasis added).

earth stations a limited, yet reasonable, amount of time to register with IBFS or forfeit any guarantee of protection.[21]

DSA would also support simplification of the registration process, including lowering the cost of registration, to make the database as accurate as possible. We believe that along with simplification of registration, however, incentives for keeping filing registration accurate in the future are just as critical and we encourage the Commission in creating the requisite requirements. And because earth station owners are often the customers of content providers that transmit programming via satellite, the Commission should enlist content providers in the effort to ensure that all receive-only stations become aware of the public notice and deadline to register or to update an existing registration.

DSA believes that expanding shared access to locally-vacant spectrum in this band can protect incumbent operations with a Part 101 database solution that is both automated and far less complex than the Spectrum Access System that will manage shared access of the 3.5 GHz band. However, neither more efficient and intensive use of the band -- nor effective protection of incumbent FSS operations -- can be secured without a more accurate and up-to-date IBFS database.

C. An Automated Part 101 Coordination Database, Together with a Band-Wide Operability Requirement, Enables Sharing by Fixed *and* Mobile Operators

DSA believes that dynamic sharing solutions offer the potential for more intensive utilization and flexible use of the underutilized 3.7–4.2 GHz band in the near term and without

[21] Under Section 25.131(b) of the Commission's Rules, if a receive-only earth station is not registered with IBFS, is not entitled to interference protection.

risk of harmful interference to incumbent licensees. The suggestion that the 3.7-4.2 GHz band can accommodate additional shared access by only high-capacity fixed wireless operators (P2MP) *or* by mobile operators presents a false choice. An updated and automated Part 101 database can be used to coordinate actual fixed *and* mobile deployments on a localized basis, creating "flexible" shared spectrum that responds to local demand and the ability to work around band incumbents.

As an initial matter, DSA agrees with commenters who assert that the Commission can expand shared access to the 3.7-4.2 GHz band in the near term without precluding either fixed or mobile operators from coordinating use. Google, for example, states that as a practical matter, widespread use of 3.7–4.2 GHz for mobile broadband is "currently much more challenging than fixed use" and "would most likely require decommissioning FSS earth stations in the mobile service area or shifting them to other bands to ensure that mobile devices can operate widely."[22] Nevertheless, Google observes that because fixed wireless could only be coordinated in areas (or on frequencies) free of FSS operations – and because of the large amount of spectrum overall (500 megahertz) – "large blocks of frequencies and territory would remain unused" and "become available upon the removal of FSS operations."

A dynamic database coordination mechanism can best accommodate future mobile use if fixed wireless operators are subject to a band-wide operability requirement. Google correctly notes that the BAC proposal would ensure that devices are "interoperable over the entire [3.7-4.2 GHz] band. This rule would ensure that such equipment will be capable of reconfiguration to

[22] Comments of Google at 11.

adapt to any other future uses the FCC may permit in the band."[23] As in the CBRS band, if fixed P2MP operators are frequency agile, the reallocation of a portion of the band to mobile or any other service (e.g., 3700-3800 MHz) could be accommodated. And, as explained in the first section above, this frequency agility, in combination with a coordination database, addresses the concerns by FSS incumbents that earth stations must not be "locked" indefinitely into using a particular transponder, satellite or particular channel of the band.

The Commission has a number of options to ensure that the band can be put to more intensive use immediately while not excluding either mobile or fixed uses longer-term. A foundational element would be to build on the existing Part 101 coordination process, allowing for a market-demand-driven coordination of either fixed or mobile deployments in *localized* areas. Since the most valuable use of this band for mobile operators is to enhance network capacity in core urban and other high-traffic areas, it should not be necessary to ensure, in advance, exclusive access over very large or standardized geographic areas. Conversely, high-capacity fixed wireless broadband providers describe a need to coordinate access to spectrum from access points located in rural, exurban and other low-population-density areas. If all operators are authorized to coordinate relatively small protection areas based on the actual deployment and location of access points, a geolocation database could coordinate their use either on different frequencies in the same area, or in different areas on the same frequency.

[23] Reply Comments of Alphabet Access, RM-11791 at 6 (Aug. 22, 2017) ("Alphabet Reply Comments"); *accord* Comments of Frontier Communications Corp., Windstream Services, LLC, and Consolidated Communications, Inc. at 10. *See* Petition for Rulemaking of the Broadband Access Coalition, RM-11791 (filed June 21, 2017).

Moreover, if the Commission is concerned that even a band-wide operability requirement may not reserve a sufficient amount in an area for one service or the other, the agency could adopt a condition limiting the overall share of the band that can be coordinated on a primary basis for a FS/P2MP deployments in a local area, for example, while reserving preferential access to later deployments for CMRS above that threshold. These percentages (as well as allowable power limits) could also vary depending on the population density of the location (e.g., of that census tract).

Motorola Solutions similarly "supports the utilization of spectrum sharing techniques that . . . allow[] both fixed and mobile services to operate in the 3.7-4.2 GHz band."[24] Motorola suggests that if mobile and portable devices are "restricted to a relatively low power level (e.g., 23 dBm/10 MHz)," this will better protect incumbents, allow the band to be used more intensively, and accommodate a wide variety of both mobile and fixed uses.[25] Sony and Federated Wireless also support the use of a dynamic database mechanism to enable flexible fixed and mobile sharing of the 3.7-4.2 GHz band, although they propose doing so by extending the Spectrum Access System (SAS) and three-tier CBRS framework that will soon be implemented on the adjacent 3550-3700 MHz band.[26]

[24] Comments of Motorola Solutions, Inc. at 1.
[25] *Id*. at 2.
[26] Comments of Sony at 1-2; Comments of Federated Wireless at 3 (a "SAS-supported sharing framework [is] readily extensible to 3.7-4.2 GHz" and "the best—and only—path to enabling flexible fixed and mobile use of the band by the end of this decade"). Microsoft makes a similar proposal to extend the CBRS framework to enable the coordination of GAA use for fixed or mobile operations, under Part 96 rules, up to 3.8 GHz. Comments of Microsoft at 4-6. *See also* Comments of Comsearch at 3 ("Comsearch believes that sharing could be possible by using a SAS or database that is aware of actual frequencies received by the earth stations and can suggest frequencies to the mobile broadband system that do not conflict").

Although DSA is not taking a position at this time on the exact parameters for shared access, we are confident that an automated database mechanism would be capable of managing the coordination of both fixed and mobile operations, just as the Spectrum Access System is expected to accommodate both fixed and mobile use of the 3550-3700 MHz band under the rules adopted for the adjacent CBRS band.

III. COMMENTS SUPPORT UNLICENSED USE IN THE 6 GHz BAND IN A MANNER THAT PROTECTS INCUMBENT USERS

In our Comments, the DSA strongly supported rules to permit use of 5.925-7.125 GHz (the "6 GHz band") for unlicensed wireless broadband.[27] The FCC recognized in the NOI that urgent action is needed to identify mid-band spectrum for broadband services. 802.11ac, which is now being deployed, and 802.11ax, which is soon to be ready for deployment, make the need for additional spectrum for Wi-Fi critical to enable the wider gigabit-capable bandwidths inherent in the new standards.[28] Access to the 6 GHz band is the only mid-band spectrum solution that has been identified for expanding wi-fi services and is thus a critical part of enabling the gigabit Internet of the future.

Commenters broadly agree that the demand for additional unlicensed spectrum for wireless services, including new high-bandwidth and high-capacity Wi-Fi, would be best

[27] DSA believes that this should be treated as a single band by the FCC because many of the same license holders, end-users, and end-uses are in both the upper and lower portions of the band. DSA also believes that enabling unlicensed use across the entire 1200 megahertz of spectrum will better enable unlicensed devices to minimize aggregate interference to incumbent receivers.

[28] The new Wi-Fi standards of 802.11ac and 802.11ax will deliver Gigabit level speed using more multi-user MIMO, high-density modulation, and wider RF bandwidth (up to 160 MHz).

addressed with mid-band spectrum in the 6 GHz band. [29] Further, consistent with DSA's comments, others indicate that protection of incumbent services are an essential component of sharing the 6 GHz band for unlicensed services.[30] Furthermore, it is generally accepted that the 6 GHz band cannot practically be shared for cellular use, due to the large and diverse incumbent community, and therefore is not a good candidate for spectrum auction.

DSA thus strongly supports the FCC opening a Notice of Proposed Rulemaking to permit unlicensed operations in the 5.925 – 7.125 GHz band using sharing techniques to protect incumbent services while allowing the spectrum to be used to meet the demand for future Wi-Fi and other unlicensed services.

IV. CONCLUSION

The DSA welcomes the Commission's efforts and global leadership to identify additional mid-band spectrum for broadband services. The comments in this proceeding support the view that in order to gain access to spectrum for broadband, protection of incumbent services will be a critical requirement. Even the wireless operators themselves, while insisting on spectrum clearing in bands where they are seeking access, have demanded protection of their services in bands where they are the incumbent user, often for their fixed service links. This reality needs to

[29] E.g., Vivint Comments at 4; HPE Comments at 8; Broadcom Comments at 9; Qualcomm Comments at 6; Microsoft Comments at 9; Wi-Fi Alliance Comments at 3; Comments of All Points Broadband, Amplex Internet, Apple, Blaze Broadband, Broadcom, Cambium Networks, Cisco Systems, Cypress Semiconductor, Dell, Extreme Networks, Facebook, Fire2Wire, Google, Hewlett-Packard Enterprise, HP, Intel, Joink, MediaTek, Metalink Technologies, Microsoft, New Wave Net, Pixius Communications, Qualcomm, Rise Broadband, Ruckus, A Unit of Brocade, Snappy Internet, Sony Electronics, Western Broadband, Wireless Internet Service Provider Association, Wisper ISP at 5.

[30] E.g., Cisco Comments at 2; Content Companies Comments at 5; Ericsson Comments at 9; Verizon Comments at 21.

be recognized and incorporated as part of the solution in making more spectrum available for broadband services.

DSA believes that dynamic spectrum sharing is the most effective and efficient method to unlock shared spectrum for broadband. Dynamic sharing is already used by the Commission to unleash unlicensed, lightly licensed, and licensed spectrum; a balanced approach for which will be necessary to ensure future high capacity services can be delivered. As the Commission moves forward toward the release of NPRMs arising from this very important NOI, we urge that the Commission take an approach to move bands early where possible to bring the benefits of unlocking mid-band spectrum for broadband as soon as possible.

The DSA urges the Commission to (1) authorize dynamic shared access to the 3.7-4.2 GHz band and update the associated licensing database; and (2) permit the critical unlicensed operations in the 5.925 – 7.125 GHz band using sharing tools to protect incumbent services. DSA believes that this approach would result in spectrum being utilized for broadband services in the shortest amount of time, to allow the U.S. economy to continue to the lead the globe in next generation broadband services.

Respectfully submitted,

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