Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
Amendment of the Commission's Rules with	)	GN Docket No. 12-354
Regard to Commercial Operations in the	)	
3550- 3650 MHz Band	)	

COMMENTS OF KEY BRIDGE LLC

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Key Bridge LLC (Key Bridge, formerly Key Bridge Global LLC) submits these comments in response to the above referenced proceeding.[1]

1 INTRODUCTION AND SUMMARY

Key Bridge is a FCC-certified operator of shared spectrum administration systems, registries and databases. Key Bridge operates and maintains one of the largest commercial databases of wireless service and spectrum occupancy information in the world. We make this information available through a portfolio of standards-compliant web services and data models, empowering clients to develop and deliver of their own wireless products and services. The Key Bridge White Space system is widely used as a secure, neutral platform for spectrum occupancy inspection, discovery and spectrum sharing innovation in the VHF/UHF TV-broadcast bands.

The Key Bridge White Space system is a TV-Band-specific instance of our commercial Spectrum

1 *See* Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550- 3650- MHz Band, Report and Order and Second Further Notice of Proposed Rulemaking, GN Docket No. 12-268, FCC 15-47 (rel. Apr. 21, 2015) (3.5 GHz Order)

Access System (SAS) that is purposefully built to support other bands and spectrum sharing rules. Key Bridge has been an active developer of SAS technologies applicable to the 3550-3700 MHz (3.5 GHz) band for several years. Our leadership in this field is widely recognized. For example Key Bridge presently leads or is a leading contributor to several multi-stakeholder groups developing technical approaches to satisfy the Commission's new Part 96 Rules.

As a trusted, neutral provider of spectrum administration systems and market-making technologies and services, Key Bridge welcomes this opportunity to share our perspectives with the Commission.

In its Part 96 Rules the Commission creates an innovative legal structure for industry and the public to share significant spectrum with a Federal incumbent.[2] However, simply authorizing access to spectrum is not a guarantee of adoption and the Commission should continue to do all it can to encourage private investment and to facilitate continuous innovation in the 3550-3700 MHz Band.[3]

The Part 96 Rules are very generous to General Authorized Access (GAA) users, which the Commission may expect to be a long-term source of innovation.[4] The Commission should also recognize and appreciate the investment and innovation of the licensed user community and encourage Priority Access License (PAL) adoption and use no less enthusiastically.

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2 In creating a three-tiered access structure the Commission has created an innovative blending of spectrum access approaches such as TV White Space, License Shared Access, and Dynamic Frequency Selection while also adding several new, original aspects.

3 Witness, for example, the anemic development of an unlicensed White Space ecosystem in the VHF/UHF bands.

4 Part 96 Rules generally favor GAA over PAL use. For example: more than 50% of total available spectrum is reserved for GAA use; the issuance of PAL licenses is constrained only to census tracts having mutually exclusive bidders; any unused PAL spectrum automatically reverts to GAA use unless actively illuminated by a PAL transmitter, etc.

Experience shows that successful unlicensed (i.e. GAA) adoption requires several market prerequisites, including: low-cost components from an existing supply chain, a set of mature and inter-operable wireless standards, plus low-cost and friction-free spectrum access from an efficient service infrastructure. Each of these GAA prerequisites requires significant investment and experience again shows more often than not that this up-front investment comes from licensed commercial operators (e.g. carriers, industrial and business users). Accordingly, in addition to the many incentives for GAA adoption the Commission should also do all it can to encourage investment and use by commercial PAL users in the 3.5 GHz band with a strategic goal of fostering a robust industry ecosystem that benefits all users. To this end the Commission should:

- enable a liquid secondary spectrum market
- adopt a hybrid definition of use
- allow license partitioning

2 THE COMMISSION SHOULD ENABLE A LIQUID SECONDARY SPECTRUM MARKET

Key Bridge concurs with long-standing Commission policy that "an expanded system of private sector markets will serve the public interest by creating new opportunities for increasing the communications capacity and efficiency of spectrum use by licensees."[5] Key Bridge also agrees with official Commission policy that a commercial secondary market can efficiently make "unused or underutilized spectrum held by existing licensees more readily available to other

5 *See* Principles for Promoting the Efficient Use of Spectrum by Encouraging the Development of Secondary Markets, FCC 00-401, December 1 2000 ("Policy Statement") at 1.

users and uses...."[6] Additionally, Key Bridge further concurs with Commission statements that, by facilitating efficient and economic spectrum allocation, a secondary market can "help to promote the development of new, spectrum efficient technologies."[7]

The 3.5 GHz band presents the Commission and the American public with a new and original opportunity to develop and realize innovative approaches to spectrum policy, management and markets that the Commission has envisioned and hoped to see realized for over a decade.[8]

The Commission has already established that a secondary spectrum market is compatible with the Communications act.[9] Key Bridge believes that a secondary spectrum market effecting the transfer (as opposed to lease) of license rights can be further perfected to comply with all aspects of the Communications act with the help, cooperation and coordination of the Commission.[10]

To realize the locked "value trapped for too many years in a regulatory box" the Commission should take additional steps and enable a truly liquid secondary market.[11] Among these enabling actions the Commission should ensure that sufficient product inventory is available to sustain a

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6 *Id.*

7 *Id.* at 2.

8 *See* Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, WT Docket 00-230, FCC 03-113, October 6, 2003 (Secondary Market Order).

9 *Id.* Also see 47 C.F.R. Part 1, Subpart X – Spectrum Leasing

10 *Secondary Market Order, citing* Dissenting Statement of Commissioner Michael J. Copps. In this regard the Commission's remarks are informative. In his dissent Commissioner Copps notes that 47 U.S. Code § 310(d) precludes the transfer of license rights "except upon *application* to the Commission and upon *finding* by the Commission that the public interest, convenience, and necessity will be served thereby" (emphasis added). The Commission found however that secondary markets can be implemented to comply with this and other Rules through a registration, notification and review procedure (e.g. using FCC Forms 603 and 608). Secondary market compliance with sections 47 U.S. Code § 310(a), (b), (c) and (e) may be readily perfected through prior registration of market participants and conventional "know your customer" obligations on a secondary market operator. Furthermore, a secondary market operator can build upon the Commission's Private Commons example and precedent to perfect compliance with 47 U.S. Code § 310(d). In cooperation with the Commission, a secondary market operator may pre-register and pre-qualify all market participants (i.e. an *application* to the Commission) to to ensure that the 1) the participant is known the to Commission and to the market operator (i.e. a "know your customer" obligation) and 2) that the public interest, convenience and necessity is served through the participant's disposal or acquisition of spectrum access rights (i.e. a general *finding* by the Commission).

11 *Id., citing* Joint Statement of Chairman Michael K. Power and Commissioner Kevin J. Martin.

liquid market and should accommodate innovative approaches to reduce transaction costs.

2.1 THE COMMISSION SHOULD ENSURE MARKET LIQUIDITY

A liquid market is characterized in its simplest form by abundance: abundance of available product, of interested buyers, of willing sellers and of ready capital. In a liquid market assets may be readily bought and sold without significant transaction costs or price volatility. Liquidity is a mandatory market condition and for a successful secondary spectrum market to emerge in the United States the Commission must ensure sufficient liquidity exists.

Unfortunately the Commission's current PAL strategy is not conducive to secondary market liquidity and should be revisited. The Commission's current competitive bidding procedures will create and make available approximately 500,000 PAL units through a Government public auction.[12] However, under the Commission's present strategy all PAL units not sold in the Government auction will be canceled until the next application filing window.[13]

The Commission's auction-exclusive approach makes sense where the only available price discovery mechanism is a Government auction. This situation need not exist in the 3.5 GHz band, where the Commission and the public are presented with a unique opportunity to appreciate and experiment with the efficient price discovery capabilities of a secondary market.

It is commonly understood that spectrum licenses establish the basis and foundation for capital formation in the wireless service industry. The Commission's auction-exclusive approach, which is designed to raise maximum up-front revenue for the public treasury, has the unfortunate effect of limiting spectrum license acquisition to only the extremely well-financed. This Government

12 Seven licenses across approximately 74,000 census tracts.
13 *3.5 GHz Order* at 123.

created market structure disadvantages or excludes medium and small businesses by design. The substantial up front capital requirements necessary to participate in a Commission spectrum auction can discourage innovation and organic development of wireless services for the simple reason that business models and execution plans must be fully developed prior to capital allocation and spectrum acquisition.

A new approach is warranted for the 3.5 GHz band and the Commission should sieze this unique opportunity for economic innovation. Instead of canceling unsold PAL inventory from a Government spectrum auction, thus creating artificial scarcity and starving a secondary market of liquidity, the Commission should instead assign all unsold PAL units to a secondary spectrum market operator for resale.[14]

By offering a large and liquid inventory of PAL units, first through a Government spectrum auction and subsequently through a commercial secondary market, the Commission will do much to foster economic innovation in the 3.5 GHz band. By this single action the Commision will enable commercial operators of all size and type to innovate at their own pace, and to acquire the spectrum rights their businesses need at the time those rights are needed, not exclusively when the Government is prepared to make them available.[15]

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14 Such an assignment is consistent with 47 USC § 309(j) to the extent that all transactions through a secondary market are conducted at fair market value. Furthermore, a secondary spectrum market easily satisfies the intent 47 USC § 309(j) and may be structured to also satisfy the exact language. 47 U.S. Code § 309(j) essentially serves to protect the taxpayer from penny bids in a no-reserve auction. That is: in an auction having no reserve price a single bidder may win with a *de minimus* offer, which is not in the public interest. It follows that in the absence of any other price discovery mechanism the only method available to the Government is mutually exclusive bidding. However the same "competitive bidding" result required by § 309(j) is established in a secondary market through the minimum offer price. In a secondary market the minimum offer price is established through an initial public offer (e.g. a primary auction) and maintained by market makers (e.g. dealers) and a conventional bid/ask order book. Minimum offer prices for PAL units in a secondary spectrum market may be initialized by a number of methods including the calculation of a synthetic "per unit" price based on some calculated metric such as Price per Mhz-Pop, for example.

15 *See Policy Statement, citing* Separate Statement of Commissioner Harold W. Furthgott-Roth. "It is difficult to find a market in which all applicable regulations have not been reflected.... By contrast, it is rare to find a

2.2 A SECONDARY MARKET CAN COMPLY WITH SUBPART Q

As described above and in the various footnotes, a secondary spectrum market can be established that is compliant with 47 CFR Part 1, Subpart Q – *Competitive Bidding Proceedings*. Furthermore, a secondary market can be development that specifically accommodates 47 CFR § 1.2106, 47 CFR § 1.2107 and 47 CFR §1.2109.

A commercial secondary spectrum market can guarantee, through a cash or bond deposit or insurance policy, sufficient to satisfy 47 CFR § 1.2106(a) to the extent that the Commission may require some form of upfront payment assurance from a secondary spectrum market-making entity. Similarly, the clearing and settlement capabilities and financial accounts between a commercial secondary spectrum market and its participants can be structured to ensure 47 CFR § 1.2107 and 47 CFR § 1.2109 are satisfied.[16]

In an envisioned secondary market scenario all revenue from the first PAL sale would accrue to the Government, while any subsequent proceeds or losses would accrue to the private PAL holder.[17] In fact, because all market participants may be reasonably expected to be pre-registered, pre-qualified, known entities, the Commission may find that transactions executed through a commercial spectrum market are significantly less prone to error or issue than a public auction.

2.3 THE COMMISSION SHOULD SEEK TO MINIMIZE TRANSACTION COSTS

In 2003 the Commission established new policies and procedures to facilitate broader spectrum

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regulation that ... reasonably accounts for its effects [on the] market."

16 Conventional market-making organizations have extensive experience handling the various aspects and requirements of trading compliance, credit, payment, clearing and settlement. This is a solved problem where substantial commercial experience and infrastructure may be leveraged in furtherance of the Commission's goals.

17 This approach complements existing auction procedure and may be considered, metaphorically, as an indefinite extension of a primary spectrum auction until 100% of the initial offered PAL inventory is sold.

access through spectrum leasing arrangements.[18] In 2004 the Commission provided for immediate (i.e., overnight) processing of certain qualifying spectrum leasing arrangements and an immediate processing procedure for qualifying license assignment and transfer transactions.[19] These existing spectrum leasing and transfer apparatus and reporting requirements are designed for traditional wireless services in traditionally licensed bands, none of which apply in the 3.5 GHz band where GAA and PAL users are free to innovate and may deploy whichever type of wireless service their needs may require, within a fairly limited set of technical operating constraints. Accordingly, the Commission should determine that 47 CFR § 1.913 does not apply to PAL users in the 3.5 GHz band and should not require extensive transaction reporting such as through FCC Form 603.[20]

Because participants in a secondary spectrum market will be pre-registered and pre-qualified there the Commission should also not require prior approval of each and every PAL exchange transaction. Instead, the Commission should expect and periodically affirm that a SAS and commercial secondary spectrum market take care to ensure that Commissions Rules and Policies are faithfully implemented.[21] For example, working together or independently, a SAS and commercial secondary spectrum market can and should each ensure that all transactions do not raise a potential public interest concern relating to eligibility and use restrictions, foreign ownership restrictions, designated entity restrictions, or other prohibited condition. Implementing

18 *Secondary Market Order*

19 *See* Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, WT Docket 00-230, FCC 04-167, September 2, 2004 (2nd Secondary Market Order) at Section IV(C)(1)(b)

20 Summarizing from 47 CFR § 1.913(a)(3): FCC Form 603 is used to apply for Commission consent to *assignments* of existing authorizations, to *transfer control*, to *notify* the consummation of assignments or transfers, and to request extensions of time. It is also used for Commission consent to *partial assignments* of authorization, including *partitioning* and *disaggregation* (emphasis added).

21 This follows the example set by the Securities and Exchange Commission (SEC) and the various exchanges and other trading industry participants, where industry participants self-police with SEC oversight and reporting.

these and other obligations may be facilitated by conventional "know your customer" obligations that may be undertaken by SAS and secondary market operators, where market participants are always pre-registered and pre-qualified according to Commission guidance.

Following a registration and qualification process, individual 3.5 GHz market participants should not be required to seek advance Commission permission to engage in a PAL transaction nor should they be required to directly file reports to the Commission. To the extent that the Commission will require immediate reporting of PAL transactions the Commission should allow a secondary market operator to implement any and all information reporting via an automated clearing and settlement procedure.

2.4 SPECTRUM HOARDING IS NOT A SIGNIFICANT RISK

Because more than 50% of the total available spectrum is reserved for GAA use Key Bridge believes the risk of spectrum hoarding is minimal and does not justify the expense or hassle of a proactive enforcement apparatus. Furthermore, any potential market harm from purposeful spectrum hoarding by a PAL user would be far outweighed by the expense and risk borne by the offending party.

Key Bridge further believes that egregious offenses and offenders to the Commission's Rules may be readily discovered through the various agents involved in administering the 3.5 GHz band, including a prospective secondary spectrum market, the various SAS instances, ESC operators, plus public feedback.[22] Rule offenses should therefore be handled on a case-by-case

22 A SAS must know when a PAL CBSD is active and on which channel the PAL CBSD is operating. A secondary market must know the aggregate spectrum holdings of market participants. A ESC may detect the presence or absence of wireless service signals. The public will have ample opportunity to report availability, manually and through automated applications. In the unlikely event that each of these administrative agents fail to identify and discipline a bad actor, all of these various resources may be tapped by the Commission to identify and enforce its rules.

basis. In the event of actual harm or market failure the Commission could revisit this issue at any time in the future.

3 THE COMMISSION SHOULD ADOPT A HYBRID DEFINITION OF USE

In its request for comments the Commission seeks input on the definition of "use" of a PAL frequency. Key Bridge believes a hybrid definition is appropriate for the 3.5 GHz band, and that the Commission should encourage flexibility and embrace innovation to the maximum extent possible as the 3.5 GHz band ecosystem evolves.

Key Bridge believes that the Commissions "use it or share it" strategy can be readily implemented by a SAS and also that the definition of "use" should be defined as the PAL holder finds most appropriate for their immediate need.[23]

We concur with Verizon that there may be occasion when a vacant channel performs a productive use. We are therefore led to the conclusion that a strict "engineering" definition of use may not be appropriate for PAL licenses in the 3.5 GHz band. Rather, Key Bridge believes the Commission should provide maximum incentive and flexibility to innovate in this regard and should provide a PAL holder with the flexibility to exploit their spectrum rights as they see fit. To this end we share the Commissions curiosity in Dr. Lehr's economic definition of use proposal to "view the PAL as an option to exclude GAA usage."[24]

Dr. Lehr's economic definition of use redefines a Priority Access License as having two parts: a right to execute ("license") and the actual execution of the right ("option"). This concept could be easily implemented in a commercial secondary market and SAS.

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23 *See 3.5 GHz Order* at III(B)(2)(b) and Appendix A §96.35(a)
24 *See 3.5 GHz FNPRM,* William Lehr Comments at 1.

It is not immediately clear however that dynamic price discovery for the PAL "option" component may be established without additional market structure development. Following the Commission's conventional strategy of only authorizing seven PAL users in a given census tract leads to the condition that, for a given PAL, only the "license" holder may execute the corresponding "option" and cause the PAL right to be perfected. In this scenario any objective, dynamic price discovery is difficult. Dr. Lehr proposes that a fixed percentage of the primary auction price be assessed upon execution. Alternatively, a dynamically calculated price could be established by a spectrum market using various factors such as the number of GAA users affected, etc. However under any envisioned scenario the option strike price of a tightly coupled license+option PAL unit may not reflect its actual economic value.[25]

Dr. Lehr's "split PAL" concept may be more naturally implemented if the Commission were to over-subscribe PAL "licenses" (conceivably without limit) while also restricting the number of exercisable "options" to seven for any given census tract. This would achieve the same result as the Commission's present 3.5 GHz band allocation strategy but with a novel twist, where a PAL "license" might be easily (and presumably cheaply) acquired by many qualified parties while the "option", required to perfect the PAL, could be made available via a competitive bidding process through a secondary market.[26]

Key Bridge believes that a secondary market implementation of both described approaches may be perfected to comply with 47 USC 310 and 47 USC 309(j).[27] Key Bridge further suggests that

25 For example, it may occur that an equivalent number of GAA users are affected by a PAL option exercised in New York city or in Anchorage, however the actual economic value of both options may diverge greatly.

26 In this scenario the "license" component of a PAL may be considered essentially as "permission to bid" and could be issued via a joint FCC / Secondary Market registration and qualification process.

27 A license issuance process could satisfy 47 USC 310 while an options price discovery would be based, ultimately, upon a competitive bidding process and satisfy 47 USC 309(j).

additional industry/Government collaboration may be required to realize this envisioned approach.

The “split PAL” concept and its variants could have significant impact on a Government spectrum auction, up to and including negating the need to hold an auction. The first described approach, where PAL license and option components are inextricably bound, would likely suppress auction revenue by a minor factor but recover the loss upon execution at a later date. In this regard the process may be revenue neutral (ignoring inflation) but the net benefit (recognizing the value of a vacant channel) does not appear to justify the expense and complexity of the necessary market and SAS administrative apparatus. In the second approach where a license is defined as a simple right to bid it may occur that a primary spectrum auction may not be needed at all yet, over the long term, the various option exercise fees could eventually meet or exceed the net present value of a conventional Government spectrum auction.[28]

Dr. Lehr's “split PAL” concept is very interesting but may also prove too radical for Commission adoption. However there is no reason the Commission could not nor should not experiment with this innovative economic approach to spectrum allocation in cooperation with a commercial secondary spectrum market.

4 THE COMMISSION SHOULD ALLOW LICENSE PARTITIONING

In general the Commission should refrain from preemptively prohibiting or obligating new and innovative approaches to spectrum use in the 3.5 GHz band.

28 In any envisioned commercial secondary spectrum spectrum market having license-related fees the collected revenue would invariably and indefinitely flow to the Government.

License partitioning is a particularly interesting idea that the Commission should accommodate (i.e. not prohibit).[29] In the more than 74,000 census tracts across the United States there are innumerable instances where only a small subset of the described geographic area may be of interest to a particular PAL holder and where access rights for the rest of the PAL census tract could be resold and put to use by another party. The immediate economic interests of the PAL holder would benefit from such flexible use; the public interest would also be served to the extent that a secondary PAL buyer will make more effective use of the PAL rights throughout otherwise fallow geographic regions that the seller may have identified. This concept naturally and logically extends to include the frequency and schedule components of a PAL.

For example, one could readily envision a regional sensor network that requires protected access to a narrow frequency band on a relatively low duty cycle. Without PAL partitioning the example system would likely be engineered to fully occupy the PAL spectrum assignment, thus satisfying any notional definition of use and preserving availability to the PAL user but also inefficiently using the spectrum to satisfy an arbitrary Commission constraint on innovation. Alternatively, if the PAL may be partitioned and the unneeded aspects sold to another user then the spectrum may be more efficiently and economically exploited.

PAL partitioning between commercial parties could be established according to specific terms and conditions that the seller may determine according to its unique business and technical requirements. These terms may be implemented by a capable SAS, which may manage the coexistence between the buyer and seller according to the agreed upon terms. The Commission

29 *See* Commission Seeks Comment on Licensing Models and Technical Requirements in the 3550-3650 MHz Band, FCC 13-144, Released November 1, 2013 (Licensing PN), *citing* Qualcomm Comments at 3-4 *and* WISPA Comments at 15.

should allow and not preclude such private arrangements. Furthermore, the Commission should not discriminate against innovative PAL arrangements by businesses, industry and enterprise users to exploit their spectrum rights by asserting that a PAL user should only occupy their minimum required PAL allocation and cede the balance to GAA users. Such a requirement ignores real-world operational needs and also the perceived but real risk that once allowed to occupy a PAL spectrum GAA users may not vacate (in the case of a SAS error) or may not vacate sufficiently quickly (in the case that they are minimally compliant) when the PAL resource is needed for commercial operation.

We agree with Google that a SAS can effectively protect a PAL device from nearby GAA operation, including the aggregate interference of multiple devices operating in the vicinity.[30] However we believe that aggregate interference metrics represent significant additional complexity and do not welcome its mandatory introduction in to an already sophisticated dynamic spectrum administration system. Instead we believe a PAL holder and SAS administrator should be free to innovate in this regard. For example, a PAL holder may volunteer to allow co-channel GAA users within their PAL census tract according to certain aggregate interference constraints, and to the extent that a SAS can honor those constraints it may take advantage of the PAL offer.

PAL partitioning does not present a novel or significant technical challenge to the 3.5 GHz administrative apparatus or infrastructure. The Commission's current competitive bidding procedures will create and make available approximately 500,000 PAL units through an initial

30 *See* Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, FCC 14-49, Further Notice of Proposed Rulemaking, (3.5 GHz FNPRM). Google *Ex Parte* letter January 20, 2015 at 3, 4.

public auction.[31] The practical difference between 500 *thousand* PAL units and 500 *million* or more synthetic PAL units is merely one of scale and does not create a significant technical complication, administrative challenge or economic burden on a SAS or prospective secondary market.

Allowing PAL partitioning through a participating SAS, and also allowing partitioned PAL transactions through a secondary market, should be allowed by the Commission and endorsed as a novel economic innovation to facilitate further adoption and development of new wireless services in the 3.5 GHz band.

5 CONCLUSION

The 3550-3700 MHz Band band presents a new and unique opportunity for the Commission to foster innovative approaches to spectrum use. The Commission should continue to encourage private investment, creative innovation in wireless technologies and services, and also novel economic strategies to maximum spectrum use and utility..

The Part 96 Rules are very generous to General Authorized Access (GAA) users and the Commission should also encourage innovation from the licensed user community with equivalent enthusiasm.

Commission policy has endorsed commercial secondary spectrum markets for over a decade yet the 3.5 GHz band presents the first real opportunity to realize this potential. The Commission should do all that it can to faciliate the emergence of a robust and liquid commercial secondary spectrum market. Specifically, the Commission should not discriminate against small and

31 Seven licenses across approximately 74,000 census tracts.

medium businesses seeking commercial use of the 3.5 GHz band by relying exclusively on a traditional Government auction. Instead, the Commission should also avail itself of the immediate opportunity to innovate and experiment by assigning any unsold PAL units to a secondary market for resale.

The Commission should encourage and not preemptively preclude economic innovation in the 3.5 GHz band, and should adopt a hybrid definition of "use" where the PAL holder may exploit their spectrum rights to their maximum economic advantage, and by also allowing PAL partitioning and sub-component resale on a secondary spectrum market.

These various comments and recommended actions for the Commission are in the public interest and, with the Commissions help, guidance and cooperation, can be perfected to comply with existing regulation, rule and policy.

Respectfully submitted,

/s/

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