Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

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

COMMENTS OF THE CONSUMER ELECTRONICS ASSOCIATION

Julie M. Kearney
Vice President, Regulatory Affairs
Brian E. Markwalter
Senior Vice President, Research and Standards
Consumer Electronics Association
1919 S. Eads Street
Arlington, VA 22202
(703) 907-7644

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The Consumer Electronics Association ("CEA") hereby responds to the Federal Communications Commission's ("FCC" or "Commission") above-captioned Notice of Proposed Rulemaking ("NPRM"), which proposes rules for a new Citizens Broadband Service in the 3550-3650 MHz band ("3.5 GHz band").[1] CEA supports the Commission's exploration of the possibility of spectrum sharing in the 3.5 GHz band. However, to meet the ever-growing need for more spectrum, the Commission must remain committed to an "all of the above" approach to deploying new spectrum resources, including the clearing and reallocation of spectrum for exclusive commercial use.

I. INTRODUCTION AND SUMMARY

Spectrum is a critical input to the wireless broadband industry and, as the Commission has recognized, the U.S. is running dangerously low on this valuable resource.[2] Chairman

[1] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Notice of Proposed Rulemaking, 27 FCC Rcd 15594 (2012) ("NPRM").

[2] *Id.* at 15596 ¶ 2; FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN at xii, 76-78 (rel. Mar. 16, 2010) ("National Broadband Plan" or "NBP"), *available at* http://www.broadband.gov/plan/.

Genachowski recently noted that "U.S. mobile data traffic grew almost 300% last year, and driven by 4G LTE smartphones and tablets, traffic is projected to grow an additional 16-fold by 2016. With this exponential growth, demand for our wireless capacity is on pace to exceed supply, even with significant new spectrum coming online."[3] Indeed, the U.S. is expected to have a spectrum deficit of nearly 300 MHz in 2014.[4]

The Commission must explore all options to address this spectrum deficit so that commercial wireless broadband can continue to help grow the U.S. economy and bring other substantial benefits. As CEA President and Chief Executive Officer Gary Shapiro said recently, "wireless broadband is America's – and the world's – economic future."[5] Innovation in mobile broadband has driven U.S. economic growth by creating "well over one million U.S. jobs over the past four years,"[6] and produced an estimated $33 billion in productivity improvements for U.S. businesses in 2011 alone.[7] Furthermore, "[p]olicies to promote unlicensed spectrum use

[3] Julius Genachowski, Chairman, FCC, Remarks at Vox Media Headquarters, Winning the Global Bandwidth Race: Opportunities and Challenges for the U.S. Broadband Economy, at 10 (Sept. 25, 2012), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-316462A1.pdf.

[4] FCC Staff Technical Paper, *Mobile Broadband: The Benefits of Additional Spectrum*, at 2, 18 (Oct. 2010), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-302324A1.pdf.

[5] Gary Shapiro, *Congress Gets It On Wireless Broadband*, FORBES (Feb. 22, 2012) ("Shapiro Article"), http://www.forbes.com/sites/garyshapiro/2012/02/22/congress-gets-it-on-wireless-broadband/.

[6] Julius Genachowski, Chairman, FCC, Prepared Remarks to the University of Pennsylvania – Wharton, *Winning the Global Bandwidth Race: Opportunities and Challenges for Mobile Broadband*, at 2 (Oct. 4, 2012), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-316661A1.pdf. *See also* Comments of the Consumer Electronics Association, GN Docket No. 12-268, at 9-10 (filed Jan. 25, 2013) ("CEA Incentive Auction Comments").

[7] Roger Entner, Recon Analytics, *The Wireless Industry: The Essential Engine of US Economic Growth*, at 33 (May 2012) ("*The Essential Engine of US Economic Growth*"), http://reconanalytics.com/wp-content/uploads/2012/04/Wireless-The-Ubiquitous-Engine-by-Recon-Analytics-1.pdf.

alongside licensed uses…contribute tens of billions of dollars to our economy each year."[8] Additional licensed and unlicensed spectrum will further promote productivity and boost employment. One study estimates that for every 10 MHz of additional licensed spectrum assigned to wireless providers, there will be more than 7,000 new wireless industry jobs, $1.924 billion in additional revenue to wireless operators, $439 million of additional sales of wireless devices, and $263 million in new application and content revenues.[9] Additional spectrum for mobile broadband will also improve healthcare services and education, and drive unprecedented levels of civic engagement.[10]

Given the need to free additional spectrum for consumer use and the clear benefits of doing so, the Commission is correct to explore innovative technologies for sharing between Federal and non-Federal users in the 3.5 GHz band. As the NPRM notes, such a service could help address the ongoing capacity shortage and promote innovation.[11] However, the dynamic access model the Commission proposes for the 3.5 GHz band is a long-term solution. These technologies require additional time to research, develop, test, and deploy prior to adoption on a commercial basis. The exploration of long-term solutions to the spectrum crunch should not distract the Commission from simultaneously pursuing near- and intermediate-term solutions as well.

The Commission should proceed with caution and act based on prior experience when implementing this new dynamic access model to the 3.5 GHz band, so that it can maximize the long-term utility of the band. For example, it should modify its proposed Priority Access tier to

[8] News Release, *Statement from FCC Chairman Julius Genachowski on House Passage of Voluntary Incentive Auction Legislation*, at 2 (Dec. 13, 2011) ("Genachowski Statement").

[9] *The Essential Engine of US Economic Growth* at 26, exhibit 13.

[10] CEA Incentive Auction Comments at 11-12.

[11] NPRM, 27 FCC Rcd at 15599 ¶ 13.

make it more broadly available on a licensed basis, and should leverage the lessons learned in the TV White Spaces proceeding in order to expedite development in the band. The Commission should also design a spectrum access system that prevents interference and is secure and easy to use. In addition, the technical rules should maximize commercial usability of the spectrum.

Finally, dynamic sharing technologies are not a "silver bullet" solution to the spectrum crunch, and they cannot be the sole tool in the Commission's tool belt. This approach, while laudable, should not delay or divert the Commission's efforts to clear and reallocate spectrum for exclusive commercial use.

II. DYNAMIC SHARED ACCESS MAY BE ONE VIABLE LONG-TERM TOOL TO HELP ADDRESS THE SPECTRUM CRUNCH

Dynamic shared access has the potential to be a useful tool to help address the spectrum shortage. This approach, however, represents a long-term vehicle to address the spectrum crunch. The technologies being explored have not yet been fully commercially deployed or proven. As the Commission acknowledges, the proposal involves "a new generation of this dynamic database technology. Its creation would require significant planning and testing."[12] To illustrate, while the Commission authorized TV white space ("TVWS") use in 2008, the Office of Engineering and Technology has only just authorized white space devices to operate in seven east coast states and the District of Columbia; nationwide authorization remains pending.[13]

While dynamic spectrum sharing approaches may, in the future, be well suited for certain bands and uses, implementation of dynamic spectrum sharing technology must not slow the Commission's pursuit of other means to address the spectrum crunch, including clearing and

[12] *Id.* at 15614 ¶ 58.

[13] Office of Engineering and Technology Authorizes TV White Space Database Administrators to Provide Service to Unlicensed Devices Operating on Unused TV Spectrum in the East Coast Region, Public Notice, 27 FCC Rcd 15099 (2012).

reallocation of spectrum for exclusive commercial use. Time is of the essence – the Commission should continue to pursue an "all of the above" approach to increasing spectrum availability. The Commission's primary focus must be on clearing and reallocating as much federal spectrum as possible as expeditiously as possible to enable operators to meet consumer demand, and to fuel the U.S. economy with new jobs and investment. The time to act on federal spectrum clearing measures – not just sharing proposals – is now.

III. A WELL-DESIGNED SPECTRUM ACCESS SYSTEM SHOULD ENCOURAGE USE OF THE SPECTRUM, PREVENT INTERFERENCE, AND BE SECURE AND EASY TO USE

If the Commission proceeds with the proposed dynamic spectrum access model, it should act to expedite the availability of the spectrum – and deployment of devices – for commercial use. The Commission can do so by adopting a spectrum access system that promotes use of the band, and effectively and efficiently serves its purpose of avoiding interference.

The Commission should make its proposed intermediate "Priority Access" tier available to all users in order to encourage robust use of the 3.5 GHz band. As currently proposed, the Priority Access tier would be available only to a few types of entities who fall within the currently undefined category of "mission critical" users. By reserving some of the spectrum for this limited class of "mission critical" users, the Commission's proposal could significantly limit access by General Authorized Access ("GAA") users, creating uncertainty for GAA users and making the available spectrum less robust and reliable. Since the Priority Access spectrum would be limited to only a few categories of users, the band would likely be underutilized.

In light of the foregoing, the Commission should modify its proposal by making the Priority Access tier available to all users. Priority Access users should be permitted to register their facilities and, in those areas, should be entitled to interference protection for operations on their registered facilities from GAA users. These changes would provide comfort to users

regarding access to the band and protection of operations, and would foster investment and innovation in this space. The resulting robust use of and investment in the 3.5 GHz band better serve the Commission's underlying goal to make this spectrum available as a viable spectrum resource.

The Commission also should build the 3.5 GHz spectrum access system ("SAS") on lessons learned from the existing TVWS system, which prevents interference through a geo-location system relying on multiple databases operated by commercial entities. The Commission, in conjunction with industry, developed the TVWS model over several years, and continues to refine that model. The Commission should apply to the 3.5 GHz band those components of the TVWS model that appear to have worked effectively. For example, the 3.5 GHz SAS rules should allow for multiple commercial database operators as do the TVWS rules. As the Commission found in the context of the TVWS, allowing multiple database operators will prevent monopoly control by a single administrator, could incentivize operators to offer additional services beyond the minimum required by the rules, and will help ensure that database services will be available on a fair and low (or no) cost basis.[14] Allowing multiple database operators will also promote redundancy and reliability.

The Commission also should apply the technical design of the TVWS shared database system to the SAS. The TVWS model is familiar to manufacturers, incumbents, and other stakeholders, and basing SAS on it would result in a database and registration process that is

[14] *Unlicensed Operation in the TV Broadcast Bands*, ET Docket Nos. 04-186; 02-380, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807, 16878 ¶ 204, 16884 ¶ 221 (2008); *Unlicensed Operation in the TV Broadcast Bands*, ET Docket Nos. 04-186; 02-380, Second Memorandum Opinion and Order, 25 FCC Rcd 18661, 18704 ¶ 104 (2010) ("*Second White Spaces MO&O*").

easier to implement. By building on the work in the TVWS proceeding, the Commission could accelerate the deployment of a 3.5 GHz spectrum access system.

One way in which the 3.5 GHz band differs from the TVWS band is that certain incumbents in the 3.5 GHz band are military users with important security concerns.[15] Because of the classified nature of certain incumbent operations in the band, the SAS should include additional features to protect the security of those incumbents. For example, security concerns can and should be addressed through the database operator certification process to be established by the Commission, and in the operating rules of the system. The Commission should work closely with the National Telecommunications & Information Administration ("NTIA") and the affected federal entities to ensure that the certification process and operation of the SAS address any potential security concerns. In the past the Commission has successfully dealt with classified government operations in a sharing context, such as when it created the Millimeter Wave 70-80-90 GHz Service.[16]

The Commission should not require 3.5 GHz devices to incorporate spectrum-sensing technology to prevent interference. As both the Commission and CEA have noted previously, spectrum-sensing technology continues to develop and has promise as a future method of mitigating interference in shared spectrum.[17] However, given the technology's nascent state, spectrum-sensing should not be required as a mechanism to prevent interference. In the TVWS proceeding, the Commission ultimately rejected a spectrum-sensing requirement, after a

[15] NPRM, 27 FCC Rcd at 15628 ¶ 105.

[16] *See Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands*, WT Docket No. 02-146; RM-10288, Report and Order, 18 FCC Rcd 23318 (2003).

[17] *Second White Spaces MO&O*, 25 FCC Rcd at 18687 ¶ 60; Comments of the Consumer Electronics Association, ET Docket Nos. 04-186; 02-380, at 3-4 (filed Jan. 31, 2007).

thorough and time-consuming examination of the technology.[18] In the 3.5 GHz band, as with TVWS operations, a geo-location database system should be sufficient to mitigate interference with incumbents, and requiring spectrum-sensing technology here would only delay deployment.

IV. THE COMMISSION SHOULD ADOPT REASONABLE TECHNICAL RULES THAT MAXIMIZE THE COMMERCIAL USABILITY OF THE SPECTRUM WHILE PREVENTING INTERFERENCE TO INCUMBENT USERS

If the Commission establishes a dynamic spectrum access model in the 3.5 GHz band, it should adopt technical rules that are sufficient to protect Federal and fixed satellite service ("FSS") incumbents, while providing flexibility for commercial use. Specifically, the Commission should evaluate NTIA's proposed exclusion zones, and narrow those exclusion zones to reflect the proposed use of small cell technology in the band. In addition, the Commission should follow its long history of technological neutrality by rejecting receiver mandates. Instead, the Commission should focus on performance-based, industry-developed standards that allow manufacturers and service providers to develop and deploy equipment that works effectively in the relevant technology environment while also meeting consumer needs.

As noted in the NPRM, NTIA issued a "Fast Track" report proposing technical rules for transitioning exclusive federal spectrum to shared commercial use in the 3.5 GHz band.[19] Those proposed rules included exclusive zones around incumbent users, within which commercial operations would be prohibited. The NPRM estimates that the NTIA-proposed exclusion zones would bar commercial service in the 3.5 GHz band in areas covering nearly 60% of the U.S.

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[18] *Second White Spaces MO&O*, 25 FCC Rcd at 18684-85 ¶ 54.

[19] NPRM, 27 FCC Rcd at 15601 ¶ 18, 15617 ¶ 67, 15629 ¶ 110. *See also*, NTIA, U.S. Dept. of Commerce, *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, 4200-4220 MHz, and 4380-4400 MHz Bands* (rel. Oct. 2012) ("Fast Track Report"), *available at* http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation_11152010.pdf.

population.[20] The NPRM also notes that, with respect to FSS incumbents, the rules governing use of spectrum at 3650-3700 MHz (the "3.65GHz band") provide for exclusion zones of 150 km from FSS facilities.[21] The Commission should adopt its proposal to establish protection zones that are significantly smaller than the zones proposed in the NTIA Fast Track report (with respect to federal incumbent users) and smaller than the exclusion zones applied to FSS operators in the 3.65 GHz rules.[22] The exclusion zones in both the Fast Track report proposal and the 3.65 GHz rules were premised on LTE/WiMax use of the spectrum, with large cells and powerful transmitters.[23] Recent analysis by the Commerce Spectrum Management Advisory Committee ("CSMAC") indicates that these exclusion zones were far too large even for LTE operations, and suggests that other approaches – such as Protection Zones where operations are restricted but not completely banned – would adequately protect incumbents.[24] The NPRM's small cell approach, with its lower transmitter power, should present far fewer interference concerns. Therefore the Commission should adopt its proposal to evaluate small cell sites usage of the spectrum, and provide appropriately-sized exclusion zones to protect incumbents.

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[20] NPRM, 27 FCC Rcd at 15617 ¶ 67.

[21] *Id.* at 15635 ¶ 124.

[22] *Id.* at 15630 ¶ 111 ("[W]e believe that modifying some of the parameters on which these [Fast Track report] exclusion zones were based, in light of the small cell deployment scenarios and proposed technical rules, can reduce the size of the exclusion zones.").

[23] *Id.* at 15631 ¶ 115.

[24] *See*, U.S. Dept. of Commerce, *Identification of 15 Megahertz of Spectrum between 1675-1710 MHz for Reallocation from Federal Use to Non-Federal Use Pursuant to Section 6401(a) of the Middle Class Tax Relief and Job Creation Act of 2012*, Report to the President, at 1-2 (Feb. 2013), *available at* http://www.ntia.doc.gov/files/ntia/publications/1675-1710_mhz_report_to_president_02192013.pdf (indicating that CSMAC anticipates recommendations from Working Group 1 regarding the size of exclusion zones and coordination of commercial system implementation within protection zones in the 1695-1710 MHz band).

The Commission's technical rules should provide flexibility to allow Priority Access and GAA users to work with other Priority Access and GAA users in order to maximize utilization of the spectrum. The Commission should reject any specific technology mandates on receivers or transmitters, consistent with its longstanding policy on technology neutrality.[25] If the record demonstrates a need for some protective measures, the Commission should look first to performance-based criteria to address interference issues among operators. As the Commission has noted repeatedly, marketplace flexibility and technology neutrality best foster innovative use of spectrum.[26] Focusing on performance-based standards developed by stakeholders will prevent interference while enabling manufacturers to develop innovative equipment more rapidly.

V. SPECTRUM SHARING CANNOT SUBSTITUTE FOR – OR ACHIEVE THE SAME BENEFITS AS – SPECTRUM CLEARING AND REALLOCATION

The Commission should not in any way substitute dynamic spectrum access in this band – no matter how promising in theory – for concrete actions that clear and reallocate desirable federal spectrum for exclusive commercial use. The Spectrum Act reflects a strong Congressional preference for clearing federal spectrum and reallocating it for commercial use.[27] The Spectrum Act requires that federal spectrum be reallocated, cleared, and auctioned.[28] Indeed, Congress mandated that NTIA prefer reallocation for exclusive non-Federal use when deciding between reallocation or sharing of spectrum, and use a spectrum sharing approach only

[25] *See, e.g. Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357, 12403 ¶ 127 (2012) ("Incentive Auction NPRM").

[26] National Broadband Plan at 78-79 ("In general, where there is no overriding public interest in maintaining a specific use, flexibility should be the norm. … Spectrum flexibility, both for service rules and license transfers, has created enormous value.").

[27] Incentive Auction NPRM, 27 FCC Rcd 12357; Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6401-14, 126 Stat. 156, 222-37 (2012) ("Spectrum Act").

[28] Spectrum Act § 6401, 126 Stat. at 222-24 (setting deadlines for the clearing and auction of numerous spectrum bands).

when the relocation of the incumbent federal entity is "not feasible because of technical or cost constraints."[29] The Spectrum Act also amended the Commercial Spectrum Enhancement Act to expand the scope of federal costs eligible for reimbursement in connection with clearing spectrum for commercial use, thereby emphasizing the importance of clearing and reallocation.[30] The Commission itself has also consistently and successfully addressed spectrum needs through spectrum clearing and reallocation, and should continue to follow this approach.[31] As Chairman Genachowski has stated, "[w]henever possible, we must continue to clear and reallocate – to clear inefficiently used spectrum for flexible broadband use."[32] In recent years, the Commission has "work[ed] extensively to clear wireless spectrum for traditional, exclusive licensing uses."[33] This approach has brought spectrum into the marketplace and billions of dollars into the U.S. Treasury. The Commission should not diverge from this path or delay its ongoing efforts to examine, clear, and reallocate other bands.

Some have claimed that the period of clearing and reallocating spectrum is over, as there is no longer any "low-hanging" spectrum to be repurposed. The Commission should reject this

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[29] Spectrum Act § 6701, 126 Stat. at 252 (adding new 47 U.S.C. 923(j), Relocation Prioritized Over Sharing).

[30] Spectrum Act § 6701(a), 126 Stat. at 245.

[31] Mignon Clyburn, Commissioner, FCC, Prepared Remarks for the 2nd Annual Americas Spectrum Management Conference, at 2 (Oct. 23, 2012) ("[W]e're working to clear new bands for flexible commercial broadband use. Traditionally, the FCC did this by working with other U.S. federal agencies to clear and reallocate federal government spectrum for commercial use."), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-316948A1.pdf; Julius Genachowski, Chairman, FCC, Prepared Remarks for the President's Council of Advisors on Science & Technology, at 2 (July 20, 2012) ("Genachowski PCAST Remarks") ("Historically, our basic strategy has been to clear spectrum and reallocate it. This is a strategy that has delivered tremendous benefits for America."), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-315355A1.pdf.

[32] Genachowski PCAST Remarks at 2.

[33] NPRM, 27 FCC Rcd at 15606-07 ¶ 34.

idea. In reality there are large swaths of inefficiently utilized spectrum, largely because federal users lack sufficient incentives to use spectrum efficiently. Realigning these incentives – perhaps through spectrum use fees or spectrum currencies – would break the spectrum logjam created by federal users and would free up new spectrum for clearing and reallocation.

VI. CONCLUSION

The Commission's proposal to implement a dynamic spectrum access model in the 3.5 GHz band holds promise as a long-term vehicle to address the nation's spectrum shortage, but the Commission should proceed with caution. Further research, development, and testing are required before this model can be implemented. The framework should be carefully designed to meet the needs of incumbents and commercial users. Most importantly, the Commission must concurrently continue to pursue the critical, Congressionally-mandated mission to clear and reallocate additional spectrum to address the spectrum crunch.

Respectfully submitted,

CONSUMER ELECTRONICS ASSOCIATION

By: */s/ Julie M. Kearney*

Julie M. Kearney
Vice President, Regulatory Affairs
Brian E. Markwalter
Senior Vice President, Research and Standards
Consumer Electronics Association
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