

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
Expanding the Economic and Innovation)
Opportunities of Spectrum Through Incentive) GN Docket No. 12-268
Auctions)
)
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)

To: The Federal Communications Commission

**COMMENTS OF THE CONSUMER ELECTRONICS
ASSOCIATION**

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January 25, 2013

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EXECUTIVE SUMMARY

As Congress, the Administration, and the Commission have recognized, the looming spectrum shortage in the United States can and must be addressed in a number of ways, including through this important auction process. CEA is proud to have been a promoter and supporter of incentive auctions from Day One and intends to continue to play a constructive and forward-looking role as the FCC implements its incentive auction authority and conducts this historic auction, the first of its kind in the world. The broadcast incentive auction will be a win-win: for innovation, for consumers, and for our nation.

Thanks to the Federal government's recognition that more spectrum means better and more innovative wireless services and devices, more jobs, and a stronger U.S. economy, efforts already are underway to repurpose federal spectrum, relocate certain commercial incumbents, and revise FCC rules to make existing allocations more viable for mobile broadband service. However, more spectrum is needed to continue to fuel wireless broadband and accelerate the U.S. economy's growth.

Under Chairman Genachowski's leadership, the FCC has identified a path forward to repurpose a portion of the TV broadcast spectrum for wireless broadband devices and services. This is prime spectrum for commercial wireless purposes, and the FCC has developed a groundbreaking approach – fully endorsed by Congress and the White House – to shift it to its highest use. The NPRM represents a tremendous step forward in bringing critical spectrum to market, but the FCC cannot stop – or even slow down – here. Once the Commission has gathered the necessary information through the comment cycle, it should focus on expeditiously establishing a simple, straightforward auction design that will maximize participation in both the reverse and forward phases of the auction, balance the interests of all parties, and facilitate access to and innovative uses of the new 600 MHz band. The Commission also must move quickly to address international coordination issues with Canada and Mexico, perhaps through a task force or similar working group dedicated to that effort, so that this important process does not delay the incentive auction and access to 600 MHz spectrum.

In particular, as the Commission moves forward to implement Congress's directives, it should embrace four key principles to best ensure a successful broadcast incentive auction:

- *Maximize Participation.* The Commission should seek to maximize voluntary participation in both the reverse and forward auctions. High participation rates will drive the collection of more spectrum and auction revenues.
- *Adopt Simple and Straightforward Rules.* The Commission should keep the auction rules and procedures as simple as possible. The auction is already likely to be the most complicated the Commission has operated; it should avoid unnecessarily complicating things further.
- *Balance Interests of All Parties.* The Commission must strike the right balance between stakeholder interests in a way that recognizes all concerns but remains true to the goal of the Spectrum Act to free up spectrum in a timely manner.

- *Promote Innovation.* As the Commission outlines the structure of the incentive auction and the 600 MHz band plan, it should reject calls to mandate interoperability or require certain technologies. Flexible use has a proven track record of promoting innovation, and the Commission should continue that policy.

In addition to these four key principles, these comments describe specific ways the Commission should implement the broadcast incentive auction. First, the Commission should design its 600 MHz band plan to best foster innovation in the band, which requires dividing the band into spectrum license blocks most useful for mobile broadband. Forward auction bidders who intend to use the spectrum will best be able to recommend an appropriate band plan, but it appears that 5x5 MHz generic paired blocks, with package bidding allowed, is likely to best enable providers to assemble the amount of spectrum they need to offer mobile broadband. The band plan should also support a uniform nationwide downlink band to reduce some of the potential uncertainty.

Once licenses are allocated, license holders should be permitted to use the spectrum as they wish, with only minimal restrictions. The Commission should stay true to its successful history of flexible use by allowing consumer needs and technological advancements to drive interoperability and by resisting calls to require the use of any particular technology in some or all of the band. On other technical matters, the Commission should adopt a conservative, pragmatic approach. The pass band should be sized consistent with today's filter technology, not for future, aspirational technologies. Guard bands must be large enough to prevent interference, and should include remainder spectrum, and support non-interfering unlicensed operation. The remainder of the other necessary technical rules should be modeled after similar rules for the 700 MHz band.

CEA's members have a substantial interest in unlicensed spectrum, which has emerged as a hotbed of innovation and can further benefit consumers in tandem with the new, licensed spectrum in the 600 MHz band. In the Spectrum Act, Congress gave the FCC authority to allow unlicensed use of recovered spectrum, and the Commission has broad authority to allocate other spectrum for unlicensed use. The Commission thus should use this proceeding to support and expand opportunities for unlicensed use. In particular, the Commission should permit unlicensed operation in the guard bands after careful consideration of the issues associated with such operations in terms of potential interference to and from adjacent licensed mobile and broadcast operations once the technical parameters for the adjacent licensed services are established. The Commission also should open one of the two TV channels currently reserved to wireless microphones for general unlicensed use.

The Commission should design the reverse and forward auctions to maximize participation and serve the primary goal of the Spectrum Act: clearing spectrum. For example, the Commission should adopt bid collection procedures that minimize the burden on broadcasters. If the record indicates that broadcasters interested in bidding are comfortable with a descending clock approach, the Commission should adopt it. Winning bids should be those that would maximize the amount of spectrum cleared. In designing the forward auction, the Commission should rely on its experience conducting over 80 auctions. To the extent the record

suggests that an ascending clock auction will facilitate a successful forward auction and not depress the revenues generated, the Commission should adopt the proposal. In addition, many of the Commission's rules in prior successful auctions can and should be applied to the forward auction.

Finally, the Commission must establish an efficient post-auction process, with concrete milestones and hard deadlines, in order to deliver newly-freed spectrum to consumers in a timely manner as soon as possible after completion of the auction. In repacking, the Commission should make all reasonable efforts to preserve broadcasters' existing service areas and populations. However, there may be some situations in which reductions in services areas of more than two percent will occur, notwithstanding substantial FCC efforts to avoid such reductions. It is reasonable in such cases for the Commission to allow a greater than two percent change in contour or interference level if it is necessary to accomplish the primary objective of the Spectrum Act. Such limited circumstances must not be allowed to undermine the auction process or to preclude the FCC from achieving the larger goal of freeing up spectrum. The rules and procedures governing reimbursement for relocation expenses should fairly and timely reimburse broadcasters for their reasonable expenses – perhaps by paying estimated costs before the transition.

CEA is glad to serve as a resource in any way useful as the Incentive Auction Task Force and the Commission move forward in this historic endeavor.

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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, which formally launches the Commission’s implementation of the broadcast incentive auction provisions of the Middle Class Tax Relief and Job Creation Act of 2012 (the “Spectrum Act”).¹ As Congress, the Administration, and the Commission have recognized, the looming spectrum shortage in the United States can and must be addressed in a number of ways, including through this important process. The consumer electronics industry is proud to have been a promoter and supporter of incentive auctions from Day One and intends to continue to play a constructive and forward-looking role as the FCC implements its incentive auction authority and conducts this historic auction, the first of its kind in the world. In these comments, CEA proposes overarching, guiding principles that the FCC can use as touchstones to ensure the success of the auction. CEA then offers specific responses to proposals in the NPRM.

¹ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357 (2012) (“NPRM”); Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6401-14, 126 Stat. 156, 222-36 (2012) (“Spectrum Act”). The NPRM proposes to implement relevant portions of Sections 6401 to 6414 of the Spectrum Act.

I. INTRODUCTION

As U.S. consumers increasingly embrace mobile broadband in countless new ways, wireless broadband usage continues to soar. Licensed and unlicensed services have created millions of jobs and poured billions of dollars into the U.S. economy. However, this state of affairs is not guaranteed to continue – indeed, it is at risk. Spectrum is a critical input to the wireless broadband industry, and the U.S. is running dangerously low on spectrum available for mobile broadband. During the last few years, the wireless and consumer electronics industries have presented overwhelming evidence of staggering growth in demand for mobile broadband services and the pressing need for more spectrum. Mobile broadband device manufacturers, carriers, and applications developers have brought stunning investment and innovation to the U.S. and have shown clearly that continuing to fuel wireless broadband will help accelerate the U.S. economy’s growth.

Thanks to the Federal government’s recognition that more spectrum means better and more innovative wireless services and devices, more jobs, and a stronger U.S. economy, efforts already are underway to repurpose federal spectrum, relocate certain commercial incumbents, and revise FCC rules to make existing allocations more viable for mobile broadband service. Most critically, however, under Chairman Genachowski’s leadership the FCC has been a strong leader in identifying a path forward to repurpose a portion of the TV broadcast spectrum for wireless broadband devices and services. This is prime spectrum for commercial wireless purposes, and the FCC has developed a groundbreaking approach – fully endorsed by Congress and the White House – to shift it to its highest use. Through this incentive auction, TV broadcasters will be remunerated for relinquishing channels and making other modifications to their spectrum licenses, all of which will bring critical spectrum to market. The broadcast incentive auction will be a win-win-win: for innovation, for consumers, and for our nation.

The NPRM represents a tremendous step forward in bringing critical spectrum to market, but the FCC cannot stop – or even slow down – here. Once the Commission has gathered the necessary information through the comment cycle, it should focus on expeditiously establishing a simple, straightforward auction design that will maximize participation in both the reverse and forward phases of the auction, balance the interests of all parties, and facilitate access to and innovative uses of the new 600 MHz band. The Commission also must move quickly to address international coordination issues with Canada and Mexico, so that this important process does not delay the incentive auction and access to 600 MHz spectrum.

CEA fully supports the Commission in this endeavor and is glad to serve as a resource in any way useful to the Incentive Auction Task Force as this proceeding progresses. In particular, as the Commission moves forward to implement Congress’s directives, it should embrace four key principles to best ensure a successful broadcast incentive auction:

- *Maximize Participation.* The Commission should seek to maximize voluntary participation in both the reverse and forward auctions. High participation rates will drive the collection of more spectrum and auction revenues.
- *Adopt Simple and Straightforward Rules.* The Commission should keep the auction rules and procedures as simple as possible. The auction is already likely to be the most complicated the Commission has operated; it should avoid unnecessarily complicating things further.
- *Balance Interests of All Parties.* The Commission must strike the right balance between stakeholder interests in a way that recognizes all concerns but remains true to the goal of the Spectrum Act to free up spectrum in a timely manner.
- *Promote Innovation.* As the Commission outlines the structure of the incentive auction and the 600 MHz band plan, it should reject calls to mandate interoperability or require certain technologies. Flexible use has a proven track record of promoting innovation, and the Commission should continue that policy.

In addition to these four key principles, these comments describe specific ways the Commission should implement the broadcast incentive auction. For example, the Commission

should design its 600 MHz band plan to best foster innovation in the band, which requires dividing the band into spectrum license blocks most useful for mobile broadband. Forward auction bidders who intend to use the spectrum will best be able to recommend an appropriate band plan, but it appears that 5x5 MHz generic paired blocks, with package bidding allowed, is likely to best enable providers to assemble the amount of spectrum they need to offer mobile broadband. The band plan should also support a uniform nationwide downlink band to reduce some of the potential uncertainty.

Once licenses are allocated, license holders should be permitted to use the spectrum as they wish, with only minimal restrictions. The Commission should stay true to its successful history of flexible use by allowing consumer needs and technological advancements to drive interoperability and by resisting calls to require the use of any particular technology in some or all of the band. On other technical matters, the Commission should adopt a conservative, pragmatic approach. The pass band should be sized consistent with today's filter technology, not for future, aspirational technologies. Further study is needed to determine the appropriate size of the guard bands. They must be large enough to protect against interference between broadcast and wireless operations, and should support unlicensed operation based upon rules developed in this or a subsequent proceeding after the technical parameters for the adjacent licenses services are established, that reflect careful consideration of the potential interference issues associated with such unlicensed operations. The remainder of the other necessary technical rules should be modeled after the rules in the 700 MHz band, which provides a useful model, due to the similarity between that band and the 600 MHz band.

Unlicensed use of spectrum is an important vector of innovation that is complementary to the licensed use that will be the focus of the new 600 MHz band. In the Spectrum Act, Congress

gave the FCC specific authority to permit unlicensed use of some recovered spectrum; the Commission should apply this specific authority and its general spectrum-allocation authority to support and expand opportunities for unlicensed use. In particular, the Commission should encourage unlicensed operation in the guard bands and should open one of the two TV channels currently reserved to wireless microphones for general unlicensed use.

In designing the reverse auction, the Commission should adopt bid collection procedures that minimize the burden on broadcasters. The least burdensome method of bid collection appears to be the descending clock model, so provided the record indicates that broadcasters are comfortable with this approach, the Commission should adopt it. For bid selection, however, the Commission should identify winning bids in the manner that maximizes the amount of spectrum cleared. When repacking, the Commission should make all reasonable efforts to preserve broadcasters' service areas, but it also should recognize that service areas are based on theoretical radio frequency calculations, and therefore exact duplication is not possible – nor is it required by the Spectrum Act.

In designing the forward auction, the Commission should rely on its experience conducting over 80 auctions. To the extent the record suggests that an ascending clock forward auction will facilitate a successful forward auction and not depress the revenues generated, the Commission should adopt the proposal. In addition, many of the Commission's rules in prior successful auctions can and should be applied to the forward auction.

Finally, the Commission must establish an efficient post-auction process, with concrete milestones and deadlines as soon as possible after completion of the auction, in order to deliver newly-freed spectrum to consumers in a timely manner. As such, the Commission should require broadcasters to clear by a date certain any spectrum that voluntarily is relinquished in the

reverse auction. In addition, the rules and procedures governing reimbursement for relocation expenses should fairly and timely reimburse broadcasters for their reasonable expenses – perhaps by paying estimated costs before the transition.

II. U.S. LEADERSHIP IN INNOVATION AND MOBILE BROADBAND HINGES ON THE TIMELY RELEASE OF NEW SPECTRUM

Without additional spectrum, the U.S. cannot maintain its leadership role in developing innovative new wireless broadband devices, networks, and services that benefit consumers and spark U.S. economic growth and jobs.

Nearly three years ago, the Commission’s National Broadband Plan (“NBP”) team ambitiously proposed incentive auctions as one possible solution to the nation’s spectrum shortage. Recognizing that “[i]ncentive auctions can provide a practical, market-based way to reassign spectrum, shifting a contentious process to a cooperative one,” the NBP concluded that “incentive auctions . . . would benefit both spectrum holders and the American public, [and that] [t]he public could benefit from additional spectrum for high-demand uses and from new auction revenues.”² Thanks to the Commission’s efforts on this front under Chairman Genachowski, and Congress’s passage of the Spectrum Act,³ the Commission now has authority to conduct incentive auctions.

It is well-settled at this point, but it bears repeating: Freeing up additional spectrum by reallocating it to higher-demand use is critical. While innovation in the wireless space is infinite, the amount of spectrum available to *enable* our wireless devices and applications is constrained. In the words of CEA President and Chief Executive Officer Gary Shapiro, “You can’t create more spectrum; it’s a finite resource. Which means that while our wireless broadband demand

² FCC, CONNECTING AMERICA: THE NATIONAL BROADBAND PLAN at 81, XII (rel. Mar. 16, 2010) (“National Broadband Plan” or “NBP”), *available at* <http://www.broadband.gov/plan/>.

³ Spectrum Act, *supra* note 1..

grows each year, the supply does not.”⁴ The number of consumer devices using spectrum in the U.S. is growing rapidly; over 322 million subscriber connections existed as of June 2012, nearly 15.4 million more than in June 2011. CEA projects that nearly 132 million smartphones will be sold in 2013 alone.⁵ In addition, there are already millions of machine-to-machine devices operating on wireless networks, and that number is expected to grow nearly exponentially. Together, these consumer and business devices are driving increased data usage and spectrum congestion. As Chairman Genachowski recently noted, “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.”⁶ Indeed, the U.S. is expected to have a spectrum deficit of nearly 300 MHz less than two years from now.⁷

As Commissioner Rosenworcel has said, “[t]he numbers telling this story may be familiar, but they are so impressive they bear repeating.”⁸ Here are just some of the most recent highlights:

- According to CEA data, nearly 132 million smartphones will be sold in the U.S. this year alone, and an estimated 181 million by the end of 2016.⁹

⁴ 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/>.

⁵ CEA, *Consumer Electronics Detailed Forecast, 2011-2016* (Jan. 2013) (“CEA Forecast”).

⁶ 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.

⁷ 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.

⁸ Jessica Rosenworcel, Commissioner, FCC, Remarks at Silicon Flatirons, Washington, DC, *The Next Ten Years of Spectrum Policy*, at 1 (Nov. 13, 2012) (“Rosenworcel Remarks”), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-317319A1.pdf.

⁹ CEA Forecast, *supra* note 5, at 7.

- U.S. smartphone penetration has grown rapidly, and currently is estimated at 55% of households.¹⁰
- Average smartphone data usage has also grown rapidly. It nearly tripled in 2011, reaching 150 MB per month, up from 55 MB per month in 2010.¹¹ Increased usage is expected to continue, with the average smartphone expected to generate 2.6 GB of traffic per month in 2016, a 17-fold increase over the 2011 average.¹²
- Tablet adoption has been tremendous, skyrocketing 90% between August 2011 and January 2012, and reaching 44% of households as of January 2013.¹³
- Consumers are adopting other wireless devices as well: as of January 2012, approximately 15% of households had an in-vehicle communication and safety system, and 11% of households own a high-bandwidth wireless mobile hotspot device.
- Overall, across all wireless devices, wireless network data traffic topped 1.16 trillion megabytes from July 2011 to June 2012 – a 104% increase over June 2011’s 568 billion megabytes.¹⁴
- In early 2012, three of the four major wireless carriers offloaded more than 50% of their smartphone data traffic to Wi-Fi networks, making unlicensed spectrum a critical means for accommodating increased demand.¹⁵
- Indeed, Wi-Fi is becoming a key method of connectivity across the globe. Strategy Analytics estimates that by 2016, 800 million households or around 45% globally will use a home Wi-Fi network.¹⁶ CEA sales figures estimate that over 165 million Wi-Fi-

¹⁰ CEA, U.S. Consumer Electronics Sales & Forecasts (January 2013). *See also*, Peter Farago, Flurry Analytics, *iOS and Android Adoption Explodes Internationally* (Aug. 27, 2012), [http://blog.flurry.com/bid/88867/iOS-and-Android-Adoption-Explodes-Internationally_\(estimating_smartphone_penetration_at_78%_of_the_adult_population\)](http://blog.flurry.com/bid/88867/iOS-and-Android-Adoption-Explodes-Internationally_(estimating_smartphone_penetration_at_78%_of_the_adult_population)).

¹¹ Cisco, Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2011–2016 at 2 (Feb. 14, 2012), http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf.

¹² *Id.*

¹³ Marco Ballve, Chart of the Day: U.S. Adults Acquiring Tablets at a Dizzying Rate, Business Insider (Dec. 24, 2012), <http://www.businessinsider.com/chart-of-the-day-tablet-penetration-2012-12>; CEA, U.S. Consumer Electronics Sales & Forecasts (January 2013).

¹⁴ CTIA-The Wireless Association, *Consumer Data Traffic Increased 104 Percent According to CTIA-The Wireless Association Semi-Annual Survey* (Oct. 11, 2012), <http://www.ctia.org/media/press/body.cfm/prid/2216>.

¹⁵ Informa telecoms and media, *Understanding Today’s Smartphone User: Demystifying Data Usage Trends on Cellular & Wi-Fi Networks*, at 4 fig. 5 (2012) (“Informa Report”) (based on Jan. 2012 data collected from Android phone users of Mobidia’s My Data Manager application), http://www.informatandm.com/wp-content/uploads/2012/02/Mobidia_final.pdf.

¹⁶ Richard Thanki, *The Economic Significance of Licence-Exempt Spectrum to the Future of the Internet* at 32-33 (June 2012) (citing Burger, Andrew, *Report: Wi-Fi Households to Approach 800 million by 2016*, Telecompetitor (Apr. 5, 2012), <http://www.telecompetitor.com/report-wi-fi-households-to>

enabled devices were sold in 2012, and predicts that over 271 million such devices will be sold in 2016.¹⁷

These data points reflect the success of the mobile marketplace – success that has been achieved to date through innovation and responsiveness to consumer demand. It is essential that the Commission free the additional spectrum necessary to fuel continued innovation and to meet consumer needs. The spectrum crunch already is impacting consumers – “[e]very dropped call or ‘service unavailable’ message is a result of our wireless broadband deficit,”¹⁸ and the effects will only worsen if not addressed. Without this incentive auction, at some point in the not-too-distant future the U.S. will simply run out of wireless broadband. The consequences of this would be substantially worse than simply dropped calls or lost Internet access. This situation would handicap the entire next generation of innovators and entrepreneurs, who would have no avenue through which to grow their businesses.¹⁹

In contrast, with the right steps by government and innovators, “wireless broadband is America’s – and the world’s – economic future.”²⁰ Innovation in mobile broadband drives U.S. economic growth by creating jobs and increasing productivity. The companies that build and operate mobile broadband devices, networks, and applications already directly employ more than 400,000 people, and nearly 1.4 million people work in jobs that support the wireless industry

approach-800-million-by-2016/), <http://www.telecompetitor.com/report-wi-fi-households-to-approach-800-million-by-2016/>), <http://bit.ly/NgzCJT> ..

¹⁷ CEA, U.S. Consumer Electronics Sales & Forecasts (January 2013).

¹⁸ Shapiro Article, *see also* Gary Shapiro, *Cut the Deficit, Add Jobs and Unleash America’s Spectrum Potential*, ROLL CALL (Sept. 20, 2011), http://www.rollcall.com/news/shapiro_cut_the_deficit_add_jobs_and_unleash_americas_spectrum_potential-208871-1.html.

¹⁹ Shapiro Article.

²⁰ *Id.*

(contractors, marketers, suppliers, etc.) and would not exist otherwise.²¹ The wireless industry contributes an estimated \$88.6 billion in fees, surcharges, and taxes to federal, state, and local authorities.²² Additional licensed and unlicensed spectrum will enable those companies to continue to innovate, and spur additional employment. One study estimates that for every 10 MHz of additional 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.²³ In 2011, more than 700,000 jobs indirectly relied on the existence of the wireless industry.²⁴ Across the entire country, “[M]obile innovation is estimated to have created well over one million U.S. jobs over the past four years, even in this challenging economy.”²⁵ Even those not employed by the wireless industry benefit enormously from its existence: approximately 54% of the US workforce use wireless services in their job.²⁶

Mobile broadband is a key driver of productivity for many other U.S. industries. Remote and mobile access to business applications enables more flexible and productive work arrangements for many industries, including manufacturing and construction. Mobile broadband reduces unproductive travelling time, improves logistics, and speeds and streamlines decision

²¹ Roger Entner, Recon Analytics, *The Wireless Industry: The Essential Engine of US Economic Growth*, at 15 exhibit 7 (May 2012) (analyzing US Bureau of Labor Statistics) (“*The Essential Engine of US Economic Growth*”), <http://reconanalytics.com/wp-content/uploads/2012/04/Wireless-The-Ubiquitous-Engine-by-Recon-Analytics-1.pdf>.

²² *Id.* at 25, exhibit 12.

²³ *Id.* at 26, exhibit 13.

²⁴ *Id.* at 15, exhibit 7.

²⁵ 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.

²⁶ *The Essential Engine of US Economic Growth* at 28.

making. The wireless industry contributed an estimated \$33 billion in productivity improvements for US businesses in 2011.²⁷

Mobile broadband also improves access to healthcare services and transforms the level and nature of those services, regardless of physical location. The President's Council of Economic Advisors has concluded that mobile technologies have promising potential to positively impact the quality of patient care and slow the growth of health care costs.²⁸ Some of the possibilities include videoconferencing between a patient and a health care provider, or between two or more providers – particularly valuable for patients with limited mobility, and for bringing access to specialists in rural and underserved areas. Mobile access to electronic health records and sophisticated mobile diagnostic applications have been approved by the Federal Drug Administration and are already in use.²⁹ Mobile devices also enable remote monitoring of patients with chronic conditions, including cardiovascular problems, asthma, and diabetes. Such remote monitoring is projected to reduce health care costs by \$2 billion to \$6 billion by 2014.³⁰

Mobile broadband provides similar benefits in the context of education. Mobile access to digital instructional content has shown promise in engaging at-risk, poorly performing high school and middle school students.³¹ Mobile wireless devices enable personalized, learn-at-your-own-pace education, which drives increased engagement and mastery.³² Education

²⁷ *Id.* at 33.

²⁸ Executive Office of the President Council of Economic Advisors, *The Economic Benefits of New Spectrum for Wireless Broadband*, at 10 (Feb, 21, 2012), http://www.whitehouse.gov/sites/default/files/cea_spectrum_report_2-21-2012.pdf.

²⁹ *Id.* at 10-11.

³⁰ *Id.* at 11.

³¹ *Id.* at 12.

³² Darrell M. West, Brookings Institute, *Ten Facts about Mobile Broadband*, at 5-6 (Dec. 8, 2011), http://www.brookings.edu/~media/research/files/papers/2011/12/08%20mobile%20broadband%20west/1208_mobile_broadband_west.pdf.

applications for mobile broadband connected devices have blossomed, engaging students of many ages. Such “mLearning” students are more engaged and interactive, and report higher satisfaction with the learning process.³³

Consistent with the goals of the Commission’s staff report on the *Information Needs of Communities*,³⁴ mobile broadband also is driving unprecedented levels of civic engagement. Public officials increasingly are keeping in touch with constituents through mobile communications, and constituents are using their mobile broadband devices to record, report on, and reach out to government officials. Additionally, many consumers are using their mobile devices as a constant source of anytime, anywhere access to local, national, and world news on the issues of the day.

Mobile broadband is a critical component of the nation’s economy. Freeing up additional spectrum resources to enable the mobile industry to continue to innovate will help the nation continue to lead the world in technology innovation.

III. FOUR KEY PRINCIPLES WILL HELP ENSURE THE SUCCESS OF THE INCENTIVE AUCTION

As evidenced by the NPRM, this first-ever spectrum incentive auction will involve many moving pieces. The Commission has wisely gathered an impressive team of auction design experts and has adopted an NPRM that includes very thoughtful proposals. When considering the record on those proposals, the Commission can use the following four overarching, guiding principles as touchstones to help ensure a successful auction:

³³ *Id.*

³⁴ Steve Waldman and the Working Group on Information Needs of Communities, FCC, *THE INFORMATION NEEDS OF COMMUNITIES: THE CHANGING MEDIA LANDSCAPE IN A BROADBAND AGE*, at 120-21 (July 2011), http://www.fcc.gov/osp/inc-report/The_Information_Needs_of_Communities.pdf.

A. *MAXIMIZE PARTICIPATION*

The Commission should seek to maximize voluntary participation in both the reverse and forward auctions. While the reverse auction potentially could be successful even if only a small percentage of broadcasters participate,³⁵ the Commission will have much more flexibility in releasing spectrum for wireless use if more broadcasters participate. The NPRM appropriately has framed many of its questions, including those regarding bid options, in terms of whether a particular proposal would encourage or discourage broadcaster participation.³⁶ For example, the NPRM proposes additional ways for broadcasters to participate in the auction beyond the three bid options established under the Spectrum Act, such as bidding to relinquish a high VHF channel for a low VHF channel, or allowing UHF licensees bidding to relocate to VHF to limit such relocation to channels 7-13.³⁷ To the extent that the record demonstrates that such options would increase broadcaster participation and the Commission's flexibility in repacking without overly complicating the reverse auction, the Commission should adopt those proposals. A key input to maximize broadcaster participation is transparency on the part of the Commission. It is essential that broadcasters be presented with the full information necessary to allow them to make the decision to participate. Sharing this information should not delay adoption of the rules or the auction itself in any way; in fact, lack of transparency is more likely to slow the process.

Maximizing bidder participation in the forward auction also is important in order to generate sufficient revenue and to ensure the auctioned spectrum reaches its highest use. Thus, the Commission should reject auction-specific limitations on eligibility, including spectrum

³⁵ See Comments of Consumer Electronics Association, ET Docket No. 10-235, at 8-9 (filed Mar. 18, 2011).

³⁶ See, e.g., NPRM, 27 FCC Rcd at 12385 ¶ 85 (asking if allowing "high VHF channel" bids would increase participation);

³⁷ *Id.* at 12385-86 ¶¶ 84-88. The three statutory options are (1) license termination bids; (2) UHF-to-VHF bids; and (3) channel sharing bids.

holding limitations, as contrary to the letter and spirit of the Spectrum Act. The Spectrum Act states that “the Commission may not prevent a person from participating in a system of competitive bidding” if such person meets the necessary requirements and qualifications.³⁸ Excluding otherwise qualified bidders would not only violate the statute, but also would undermine the goal of the auction to generate sufficient revenue to cover the costs of the reverse auction as required by the Spectrum Act.

B. ADOPT SIMPLE AND STRAIGHTFORWARD RULES

The FCC should seek to keep the auction rules as simple as possible while still meeting the statutory requirements. This will help reduce the burden on parties seeking to understand this new and innovative auction process and will therefore maximize participation, as discussed above. The Chairman and Commissioners have recognized the importance of keeping the incentive auction design simple to foster participation. Chairman Genachowski said, “[O]ur work in this proceeding will be guided by a set of core goals and principles: ... We are committed to engaging with all stakeholders, learning from the public record we’ll be building, aiming for simplicity, and adjusting our proposals as necessary to ensure the auction succeeds.”³⁹ Commissioner McDowell described the auction as “the most complex spectrum auction in world history” and said that “success will come more easily if we proceed with an eye toward regulatory humility, simplicity and restraint.”⁴⁰ Commissioner Rosenworcel recently set out her own guiding principles for the incentive auctions, stating that “at every structural juncture, a bias toward simplicity is crucial,” because “[s]implicity will yield more interest in the opportunities

³⁸ Spectrum Act § 6404(17)(A), 126 Stat at 230.

³⁹ NPRM, 27 FCC Rcd at 12547 (Statement of Chairman Julius Genachowski).

⁴⁰ *Id.* at 12551 (Statement of Commissioner Robert M. McDowell).

these auctions provide for broadcasters, and in turn, this will yield more spectrum.”⁴¹ And Commissioner Pai stated that the Commission should “keep the rules as simple as possible” because “[t]he incentive auction is inherently complicated; we don’t need to introduce unnecessary complexity.”⁴² He further warned, “[R]ules that are perfect in theory may turn out to be disastrous in the real world if market participants don’t understand them or don’t like them.”⁴³ A two-sided auction for spectrum has never before been conducted, and the Commission and its auction consultants understandably have identified many possible variations for the auction design. While it is important to consider the various ways in which the auction might be most successful, the Commission should focus on creating as simple a design as possible. Simplicity – in conjunction with full transparency – is critical to provide clarity for all stakeholders, expedite the timing of the auction, and, ultimately, transition as soon as possible to the new 600 MHz band.

C. BALANCE INTERESTS OF ALL PARTIES

A balanced approach is integral to the success of the auction. In order for the auction to work, all stakeholders must feel that their interests have been considered, and that they are being treated fairly. This balanced approach must be reflected not only in the incentive auction itself, but also in the repacking model and rules. Congress has been clear that broadcasters are to be remunerated for voluntary relinquishment of spectrum and that certain protections should be afforded in repacking.⁴⁴ The Commission must adhere to these directives, but it should interpret

⁴¹ Rosenworcel Remarks, at 2-3.

⁴² NPRM, 27 FCC Rcd at 12560 (Statement of Commissioner Ajit Pai).

⁴³ *Id.*

⁴⁴ Spectrum Act § 6402, 126 Stat at 224 (adding new Section 309(j)(8)(G)(iii)(I) to the Communications Act of 1934) (“\$1,750,000,000 of the proceeds from the incentive auction of broadcast television spectrum ... shall be deposited in the TV Broadcaster Relocation Fund.”); *Id.*, § 6403(b), 126 Stat at 226-27 (establishing limitations and factors for consideration in reorganizing broadcast spectrum).

them in a manner that is most consistent with the primary goal of the Spectrum Act: freeing up spectrum in a timely manner to help meet the staggering demand for wireless broadband services. Striking the right balance among stakeholder interests and the ultimate goals of the legislation is essential to executing a successful auction that benefits all parties and industry sectors.

D. PROMOTE INNOVATION

Innovation and entrepreneurship are key to America's success⁴⁵ and must therefore be front and center in developing rules for this incentive auction. To promote innovation, the principle of flexible use should govern the Commission's consideration of a band plan and technical rules for the reclaimed spectrum, as directed by the Spectrum Act.⁴⁶ The Commission should reject calls to restrict how either licensed or unlicensed 600 MHz spectrum may be used, or to mandate the technology employed. Instead, the FCC should permit the market to determine the best and highest use of that spectrum in response to consumer demand. For example, the FCC should not artificially require interoperability across the band. Likewise, the FCC should not limit any one block to a particular technology, such as Time Division Duplex ("TDD").⁴⁷ Adhering to a flexible use policy for licensed and unlicensed spectrum will best engender innovation.

If the Commission follows these four principles, it will maximize the likelihood of a successful incentive auction.

⁴⁵ See generally, Gary Shapiro, *The Comeback: How Innovation Will Restore the American Dream* (2011).

⁴⁶ Spectrum Act § 6402, 126 Stat at 224-25 (adding new Section 309(j)(8)(G) to the Communications Act of 1934) ("[T]he Commission may encourage a licensee to relinquish voluntarily some or all of its licensed spectrum usage rights in order to permit the assignment of new initial licenses subject to *flexible-use* service rules....") (emphasis added).

⁴⁷ See NPRM, 27 FCC Rcd at 12423 ¶¶ 183-84.

IV. THE 600 MHZ LICENSE DESIGN, BAND PLAN, AND TECHNICAL RULES SHOULD FOSTER INNOVATION

Of the numerous, complex issues the Commission faces in this proceeding, CEA's members will be affected most directly by the rules for the new 600 MHz band, which the Commission should design to best foster continued innovation by service providers and manufacturers. Specifically, such rules should embrace the Commission's long-standing and successful policy of flexible use, as this will best enable licensees to adjust their networks and technology to meet shifting consumer demands and perpetual technological improvements. The Commission also should seek to ensure rapid deployment of the auctioned spectrum, so that consumers can reap the benefits as soon as possible. In order to ensure that wireless operations can commence on repurposed spectrum as soon as possible following completion of the auction, the Commission should complete the task of adding a fixed and mobile allocation throughout the UHF/VHF band now.⁴⁸ Delaying such allocation until the results of the incentive auction are known would be inconsistent with Congressional intent and the Commission's goals, as it would hinder timely access to newly available spectrum.⁴⁹

⁴⁸ See *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, Report and Order, ET Docket No. 10-235, 27 FCC Rcd 4616, 4620-21 (2012); *Innovation in the Broadcast Television Bands: Allocations, Channel Sharing and Improvements to VHF*, Notice of Proposed Rulemaking, ET Docket No. 10-235, 25 FCC Rcd 16498, 16504 (2010).

⁴⁹ Cf. Letter from Scott Goodwin, National Association of Broadcasters, to Marlene H. Dortch, Secretary, FCC, ET Docket No. 10-235 (Apr. 5, 2012) (arguing that the Commission should "stipulate allocations and service rules based on the results on the incentive auction" and requesting the Commission to seek further comment and discussion to supplement the record on the question of a new fixed and mobile allocation). In the instant proceeding, the Commission has accepted further comment and discussion on the co-primary issue, and it now indubitably has a sufficient record to move forward immediately with the necessary allocation.

A. *LICENSING TO PROMOTE CURRENT AND EMERGING TECHNOLOGY*

The Commission should design the 600 MHz band plan to best support current and emerging wireless broadband technologies. Several of the NPRM's proposals regarding the band plan appear to be consistent with these criteria.

1. THE COMMISSION SHOULD LICENSE THE 600 MHz SPECTRUM IN 5 MHz BLOCKS

The Commission should adopt its proposal to auction spectrum in 5 MHz blocks which also is consistent with the FCC TAC recommendation to “allocate spectrum in block sizes that are multiples of 5 MHz where possible.”⁵⁰ As the FCC notes, 5 MHz building blocks are most compatible with several current and emerging wireless broadband technologies, including Long Term Evolution (“LTE”), LTE-Advanced, and High Speed Packet Access+ (“HSPA+”).⁵¹ HSPA+ uses 5 MHz paired blocks of spectrum, and LTE uses blocks of various sizes but most commonly is deployed using paired blocks that are a multiple of 5 MHz in size. LTE-Advanced will do the same, once it is fully developed. For example, as the NPRM notes, Verizon has deployed 10x10 MHz LTE channels in its 700 MHz C block spectrum; AT&T uses either 10x10 MHz or 5x5 MHz LTE channels.⁵² MetroPCS is generally using 5x5 MHz LTE.⁵³ In fact, carriers have chosen to deploy networks using spectrum blocks that are multiples of 5MHz in size even when their licenses encompass larger amounts of spectrum, because current standards contemplate the use of blocks that are a multiple of 5 MHz in size. Verizon's upper 700 MHz C block license is 11x11 MHz; lower 700 MHz B and C block licenses, where AT&T is building

⁵⁰ Technical Advisory Council, FCC, Wireless Security & Privacy WG, at 13 (Sept. 24, 2012), <http://transition.fcc.gov/bureaus/oet/tac/tacdocs/meeting92412/TAC-9-24-12-Presentations.pdf>.

⁵¹ NPRM, 27 FCC Rcd at 12403 ¶ 127.

⁵² *Id.* at 12404 n.205.

⁵³ Phil Goldstein, *Verizon and MetroPCS have the same LTE adoption rate – why?*, Fierce Wireless (Mar. 28, 2012), <http://www.fiercewireless.com/story/verizon-and-metropcs-have-same-lte-adoption-rate-why/2012-03-28>.

its 4G network, are 6x6 MHz. 5 MHz blocks will best fit with the wireless broadband technologies currently being deployed, as well as with technologies still being developed.

2. PACKAGE BIDDING WILL FOSTER NATIONWIDE DEPLOYMENTS BY EXISTING OR NEW CARRIERS

The Commission should allow auction participants to bid on packages of spectrum blocks, provided such package bidding can be done in a straightforward manner. Package bidding would promote the provision of high-bandwidth wireless broadband over large blocks of spectrum and/or larger geographic areas, in response to consumer demand. As indicated above, LTE supports channels larger than 5 MHz – it also supports 10 and 15 MHz channels – and carriers may want to purchase such larger blocks of spectrum. LTE-Advanced, which is now under development, will support “channel aggregation,” permitting carriers to join together non-contiguous channels in order to achieve higher performance. Allowing carriers to bid on a package of licenses within the same geographic area would enable carriers to assemble contiguous spectrum blocks that could ultimately provide higher performance to consumers, a result that is particularly important in light of increasing bandwidth demands. Similarly, allowing carriers to bid on a package of licenses spanning several geographic areas will enable carriers to provide expanded footprints or enhanced service in their existing footprints, in response to consumer demand. Splitting the band into 5 MHz blocks and permitting package bidding will enable consumers to access the spectrum they need to enjoy robust mobile broadband service.

3. PAIRED ALLOCATIONS WILL BEST FACILITATE NEW WIRELESS DEPLOYMENT

The Commission should adopt the NPRM proposal to pair 5x5 blocks of spectrum where possible.⁵⁴ Most mobile broadband technologies operate on paired spectrum allocations, with one block dedicated to uplink communications, and the other dedicated to downlink communications. Paired allocations will therefore best facilitate the deployment of new wireless broadband services. The NPRM's proposal to allocate any additional (once pairing has occurred) relinquished spectrum to downlink-only blocks could help address the asymmetric nature of broadband communications by increasing the amount of spectrum available for downlink, and the Commission should embrace that proposal. The Commission should also be clear that the band plan permits licensees, where the technical standards such as LTE-Advanced support channel aggregation (discussed above), to bond downlink spectrum with other licensed spectrum to increase the amount of bandwidth available to provide service.

4. THE COMMISSION SHOULD AUCTION GENERIC SPECTRUM BLOCKS IF THE RECORD DEMONSTRATES THIS WILL EXPEDITE THE AUCTION

If the record reflects that generic spectrum blocks would streamline the forward auction without discouraging bidding or reducing revenue below that needed for a successful auction, the Commission should conduct the forward auction using generic blocks.

5. THE COMMISSION CAN REDUCE UNCERTAINTY BY ALLOCATING A UNIFORM NATIONWIDE DOWNLINK BLOCK

The Commission should adopt its proposal to include a uniform nationwide swath of downlink spectrum in the band plan. Potential auction participants face some uncertainty, given that the precise band plan will not be known until the reverse auction is complete. Such uncertainty could make it difficult for potential participants to evaluate where new spectrum may

⁵⁴ NPRM, 27 FCC Rcd at 12405 ¶ 132.

be available to meet their needs. A uniform nationwide allocation of downlink spectrum will help alleviate some of this uncertainty surrounding the band plan. The use of a nationwide uniform amount of spectrum for downlink will also better enable forward auction participants to plan and budget for deployment, handset procurement, and meeting consumer demand.

B. FLEXIBLE USE

Allowing flexible use will best enable licensees to resolve any technical issues associated with the new band. The Commission should follow Congresses' directives and its own past practices, and should reject certain proposals that would impinge on flexible use of the spectrum. As the NPRM notes, in 1997 Congress "recognized the potential benefits of flexibility in spectrum allocations by granting the Commission authority to provide for flexibility of use."⁵⁵ In the Spectrum Act, Congress reinforced this recognition by declaring that the licenses auctioned should be subject to flexible use service rules.⁵⁶ The NPRM explains, "[O]ver the past two decades, the Commission has developed and implemented a 'flexible use' policy that focuses on technical rules to prevent or limit interference . . . rather than prescribing specific uses."⁵⁷ The FCC also has a well-established history of rendering decisions that are technology neutral – allowing the marketplace to determine which technologies thrive.⁵⁸

⁵⁵ NPRM, 27 FCC Rcd at 12367 ¶ 23.

⁵⁶ Spectrum Act § 6402, 126 Stat at 224 (adopting new Section 309(j)(8)(G)(i) of the Communications Act of 1934, as amended).

⁵⁷ NPRM, 27 FCC Rcd at 12367 ¶ 23.

⁵⁸ See, e.g., National Broadband Plan at 79 ("allowing technologically flexible access to spectrum is an essential innovation policy that the FCC should continue to develop"); *id.* at 60 (supporting a "pro-competitive, transparent and technology-neutral" regulatory framework); Julius Genachowski, Chairman, FCC, Remarks at the International Telecommunication Union Global Symposium for Regulators, Beirut, Lebanon: *ICT: Global Opportunities and Challenges*, at 4 (Nov. 10, 2009), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-294594A1.pdf ("We also believe that any regulation should be effective and targeted, not micromanagement, and that it should strive for technological neutrality."); see also *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible*

1. TECHNOLOGY AND MARKETPLACE FORCES, NOT REGULATION, SHOULD DRIVE INTEROPERABILITY

Industry standard setting continues to be an effective process, and the government should not get in the way of rapidly evolving technology. Interoperability is a feature that is desirable to consumers and carriers, and the Commission should develop a band plan that will foster interoperability, provided the other goals – including the revenue requirements – of the auction are also met. The Commission should not, however, mandate interoperability.

As with all potential features, manufacturers and service providers must weigh, for each new handset, the benefits and costs of interoperability, using a situation-specific design and market analysis process. A one-size-fits-all interoperability mandate would hamper innovation in the wireless handset marketplace by reducing the options available to manufacturers and service providers to meet their customers' needs. An interoperability mandate in the 600 MHz band also would increase handset and deployment costs. Those costs must be weighed against any corresponding benefits, in order for service providers to determine whether their customers' interests would be served. Increased costs also could delay broadband deployment and adoption.⁵⁹

Finally, as witnessed during Auction 73, the imposition of additional technical requirements on spectrum being auctioned can significantly dampen auction revenues. In the

Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Report, 14 FCC Rcd 2398, 2402 ¶ 5 (1999) (explaining that the role of the Commission is “not to pick winners and losers, or to select the best technology to meet consumer demand” in ensuring access to broadband, but rather “to rely as much as possible on free markets and private enterprise”). The Commission has specifically applied these principles in the design of band plans in the past. *Service Rules for the 746-764 and 776-794 MHz Bands and Revisions to Part 27 of the Commission's Rules*, First Report and Order, 15 FCC Rcd 476, 489 ¶ 31 (2000) (“[T]he marketplace forces operating through the auction process, rather than regulatory fiat, will determine which of the multitude of service proposals will actually be implemented.”).

⁵⁹ Cost is a major factor in the adoption of broadband. National Broadband Plan at 168 (“When prompted for the main reason they do not have broadband, 36% of non-adopters cite cost.”).

context of the broadcast incentive auction, where revenue requirements from the forward auction are substantial, the Commission should not undercut its chances for completing a successful auction by imposing obligations that may be contrary to good business practice. For these reasons the Commission should allow the marketplace to continue to weigh the costs, benefits and technical challenges associated with interoperability and make the trade-offs appropriate to respond to consumer demand.⁶⁰

2. THE COMMISSION SHOULD ADHERE TO ITS PROPOSAL TO REMAIN TECHNOLOGY NEUTRAL

The Commission should not require the use of any particular technology on any block of spectrum available in the forward auction. In particular, the FCC should not require the use of TDD in an unpaired spectrum block. Instead, the Commission should follow its longstanding and successful flexible use policy, by focusing on establishing technical rules that minimize the potential for harmful interference, rather than dictating a particular use or technology. Indeed, the NPRM specifically states that the Commission “do[es] not propose to prescribe a specific technology for use in the band.”⁶¹ The Commission should stand by that commitment. The success of the Commission’s flexible use policy demonstrates that market forces are the most appropriate mechanism for determining what technologies will best serve consumer demand, and the Commission should therefore continue to allow market forces to guide service providers as to the technologies to deploy to best serve their customers.

⁶⁰ See generally Comments of the Consumer Electronics Association, WT Docket No. 12-69 (filed June 1, 2012) (arguing against an interoperability mandate for the Lower 700 MHz Band).

⁶¹ NPRM, 27 FCC Rcd at 12403 ¶ 127.

3. THE PASS BAND SIZE SHOULD REFLECT CURRENT, NOT FUTURE, FILTER CAPABILITIES

The Commission should adopt a 600 MHz band plan and technical rules that reflect realizable filter technologies and should support maximum pass bands of 25 MHz.⁶² This approach will avoid regulation based on technical capabilities not yet available, while leaving open the possibility to take advantage of future developments when they occur. While the need to use two filters instead of one in network equipment or devices may raise cost and technology issues, those issues should not deter the FCC from the ultimate goal of maximizing the amount of spectrum to be cleared. Indeed, the Commission's first priority in establishing an appropriately sized pass band should be to clear as much spectrum as possible for mobile broadband use, and the Commission rightly concludes that it is generally better long-term spectrum policy to clear larger bands.⁶³

4. THE GUARD BANDS SHOULD BE SUFFICIENT TO PROTECT AGAINST INTERFERENCE AND SHOULD INCLUDE REMAINDER SPECTRUM

The Commission should adopt its proposal to use guard bands in between 600 MHz downlink/uplink channels and television broadcast channels, and should include in these bands the "remainder" spectrum left over from licensing reclaimed 6 MHz broadcast channels into 5 MHz flexible use licenses.⁶⁴ However, further study is needed to determine the appropriate size of the guard bands to protect broadcast television and 600 MHz mobile communications from

⁶² The Commission correctly notes that today's filter technologies support maximum pass bands of 3-4% of the pass band center frequency. Handset technology, including filter technology, is constantly improving, and CEA expects that future filters will be capable of supporting larger pass band sizes, but not by a significant amount. Therefore a 25 MHz pass band is thought to be the maximum achievable performance in the 600 MHz band.

⁶³ NPRM, 27 FCC Rcd at 12418 ¶ 171.

⁶⁴ *Id.* at 12413-14 ¶ 156.

causing harmful interference to each other. As discussed in more detail below, the Commission also should permit unlicensed use within the guard bands on a secondary, non-interfering basis.

5. THE FCC SHOULD MORE CLOSELY EVALUATE THE PLACEMENT OF BROADCAST OPERATIONS IN THE DUPLEX GAP

The FCC's leading proposed band plan, which contemplates 90 MHz spacing between wireless uplink and downlink blocks, with broadcast operations located between those allocations, raises interference concerns for both television receivers and mobile devices.⁶⁵ Specifically, broadcast stations routinely operate in the megawatt range, and such operations in the Commission's proposed 90 MHz duplex band could cause significant interference to 600 MHz base station mobile reception. Therefore, the Commission should consider whether allocating a contiguous block for mobile broadband use (that is, placing the uplink and downlink bands, separated by a smaller duplex gap, adjacent each other), rather than separating the 600 MHz mobile broadband bands with a broadcast television band as proposed, would better avoid interference between mobile broadband services and broadcast television. For example, the Commission could allocate a contiguous UHF TV band from channel 14 to channel X [where 'X' will be determined based on the amount of spectrum reclaimed], allocate an adjacent guard band, followed by the mobile broadband downlink block, followed by a duplex gap and then the mobile broadband uplink block, up to channel 51. This band plan also would minimize the likelihood of interference between unlicensed devices in the guardbands and mobile broadband devices.

⁶⁵ A similar issue exists with respect to PCS mobile devices and H Block operations, and the Commission is considering limiting power levels of H Block devices to prevent such interference.

6. THE COMMISSION SHOULD MODEL OTHER 600 MHz BAND TECHNICAL RULES ON THE 700 MHz BAND

The Commission should use the 700 MHz technical rules as a model for 600 MHz band technical rules, as the NPRM proposes.⁶⁶ The 700 MHz technical rules generally have worked to avoid harmful interference between broadcast and mobile operations, with the one notable exception being the issue of Channel 51/52 operations, which should not arise in the context of the 600 MHz band, based either on the proposed band plan or on alternative band plans presented in the NPRM (all of which include either a guard band or other buffer operations between TV broadcast operations and 600 MHz wireless services). The 600 MHz band has similar propagation and interference characteristics as the 700 MHz band. As a result, the 700 MHz band technical rules (*e.g.*, the out-of-band emission limits, power limits, and antenna height restrictions) should work effectively in the 600 MHz band.⁶⁷

V. UNLICENSED SPECTRUM COMPLEMENTS LICENSED SPECTRUM AND SHOULD BE IMPLEMENTED IN THE 600 MHz BAND PLAN

CEA's members also have a substantial interest in unlicensed spectrum, which has emerged as a hotbed of innovation and can further benefit consumers in tandem with the new, licensed spectrum in the 600 MHz band. Unlicensed spectrum has provided a platform for innovative technologies implemented in numerous consumer electronics products, including Wi-Fi, Bluetooth, ZigBee, Z-Wave, and wireless HDMI connections, which have opened new frontiers of communications, including high-speed Internet, for consumers.⁶⁸ Without taking anything away from the benefits of licensed spectrum, unlicensed spectrum also represents a key

⁶⁶ NPRM, 27 FCC Rcd at 12412-15 ¶¶ 152-59.

⁶⁷ For example, the Commission should follow the lead of the 700 MHz rules in defining interference limits between mobile broadband and television broadcast, transmission masks, and power limits.

⁶⁸ See Comments of the Consumer Electronics Association, GN Docket Nos. 09-47, 09-51, and 09-137, at 5 (filed Oct. 23, 2009).

tool for addressing the spectrum crunch. Even today, wireless providers use Wi-Fi operating over unlicensed spectrum as a fundamental tool for offloading as much as 50 percent or more of their traffic.⁶⁹ Chairman Genachowski has been clear on this point:

“Congress [should] leave no doubt that the FCC can continue its policies to promote unlicensed spectrum use alongside licensed uses. These policies to promote unlicensed spectrum contribute tens of billions of dollars to our economy each year.... Unlicensed spectrum stimulates innovation, investment, and job creation in many ways, including by providing startups with quick access to a testbed for spectrum that is used by millions, bringing new technologies to consumers in a rapid fashion. ... [L]icensed and unlicensed should be accommodated in any spectrum legislation and should be viewed as ‘complementary rather than an either-or proposition.’”⁷⁰

Congress agreed, expressly authorizing the Commission to permit unlicensed use within the guard bands in the 600 MHz band⁷¹ while preserving the Commission’s authority to allow unlicensed use of otherwise available spectrum between licensed broadcast TV channels.

The Commission should carefully consider the potential interference issues associated with such unlicensed operations, including whether such operations would provide adequate protection to adjacent licensed mobile and broadcast operations and also whether such unlicensed devices would themselves be adequately protected from interference from licensed mobile devices as it proceeds with its proposal to allow unlicensed operations on a non-

⁶⁹ See Informa Report, *supra* note 14, at 9; see also, Lynnette Luna, *Devicescape: Average data offload to Wi-Fi is 40 percent*, FIERCEBROADBAND WIRELESS (June 19, 2011), <http://www.fiercebroadbandwireless.com/story/devicescape-average-data-offload-wi-fi-40-percent/2011-06-19>. See also, News Release, *Statement from FCC Chairman Julius Genachowski on House Passage of Voluntary Incentive Auction Legislation*, at 2 (Dec. 13, 2011) (“Genachowski Statement”) (“Wireless providers rely on Wi-Fi to ‘offload’ nearly 40 percent of traffic from their networks”), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-311528A1.pdf.

⁷⁰ See Genachowski Statement, at 2.

⁷¹ Spectrum Act § 6407(c), 126 Stat at 232.

interfering basis in the 600 MHz guard bands. In keeping with the Commission's own mantra to keep simple what is already a complex spectrum reallocation, CEA recommends that technical parameters for the adjacent licensed services be established before finalizing rules for unlicensed operation. This is especially true in light of our recommendation to consider a band plan that does not interleave broadcast and mobile services.

CEA believes guard bands could effectively serve the dual purpose of protecting TV and licensed 600 MHz operations from interference, while permitting low-power, non-interfering unlicensed use. Providing this substantial nationwide allocation of high-quality spectrum for unlicensed use will spur innovative products and services that will benefit consumers greatly, as has existing unlicensed spectrum.

The Commission also should adopt its proposal to continue to permit unlicensed white spaces devices to operate in the remaining white spaces within the TV broadcast spectrum under the Commission's existing rules.⁷² As the NPRM notes, the auction and repacking of TV channels will in some markets reduce the availability of unoccupied TV channels for white space operations, but in the vast majority of markets, unoccupied channels will remain available for white space device usage.⁷³ These devices are only just beginning to be developed and deployed, and the Commission's proposal will provide much-needed regulatory certainty that will spur deployment.

The Commission also should make available for white space device operation one of the two TV channels currently reserved for wireless microphones. Such unlicensed operations

⁷² NPRM, 27 FCC Rcd at 12439 ¶ 233. See *Unlicensed Operation in the TV Broadcast Bands*, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807 (2008); *Unlicensed Operation in the TV Broadcast Bands*, Second Memorandum Opinion and Order, 25 FCC Rcd 18661 (2010); *Unlicensed Operation in the TV Broadcast Bands*, ET Docket No. 04-186, Third Memorandum Opinion and Order, 27 FCC Rcd 3692 (2012).

⁷³ NPRM, 27 FCC Rcd at 12439 ¶ 233.

should be allowed on a shared basis that accommodates the needs of the wireless microphone community. Given the incredible benefits of permitting unlicensed devices to operate, it is in the public interest to allow diverse unlicensed operations on one of these channels.

VI. THE AUCTION DESIGN SHOULD ENCOURAGE PARTICIPATION IN BOTH THE REVERSE AND FORWARD AUCTIONS AND FOSTER OTHER CRITICAL OBJECTIVES OF THE SPECTRUM ACT

The Commission can best maximize participation by first paying close attention to comments filed by potential participants – for the reverse auction, broadcasters who are considering offering spectrum in the auction, and for the forward auction, those entities who may choose to bid on spectrum. CEA applauds the Commission and its team of world-renowned auction design experts for their openness to refining the NPRM proposals based on such input, and for their commitment to educating interested broadcasters.⁷⁴ In considering this input, however, the Commission must balance commenters’ positions with the predominant goal of the Spectrum Act, namely, clearing sufficient spectrum for commercial wireless broadband use. In addition, as part of CEA’s commitment to play a constructive and forward-looking role in the incentive auction, CEA offers these comments to complement the information provided by likely reverse and forward auction participants. Although CEA members may not bid on the newly available spectrum, they are affected by, and therefore have a significant interest in, the success

⁷⁴ The success of the incentive auction depends to a great extent on the willingness of a group of broadcasters in multiple markets to embrace the concept and give serious consideration to offering reverse auction bids. As the NPRM notes, auction design likely will impact broadcasters’ willingness to participate. *Id.* at 12361-62 ¶ 10. Chairman Genachowski has emphasized that there must be good communication between the FCC and the broadcast industry: “[The FCC is] committed to getting you the information you need to make sound business decisions and to help you recognize the full value of the opportunity.... [T]o maximize the opportunity for broadcasters, we need information from you. That is why we have already begun reaching out to get your ideas on how to develop auctions with the right incentives to encourage broad participation.” Julius Genachowski, Chairman, FCC, Prepared Remarks for the NAB Show 2012, Las Vegas, Nevada, at 5-6 (Apr. 16, 2012), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-313605A1.pdf. The Commission is taking important steps through this proceeding and its LEARN program’s workshops and webinars to ensure that all necessary information is available to interested broadcasters.

of this auction. CEA members will manufacture the handsets and other consumer devices and network equipment deployed in the 600 MHz band, as they already do today for established networks. CEA members also build and sell televisions that operate on the broadcast spectrum included in the incentive auction.

A. REVERSE AUCTION

In this first ever reverse auction related to spectrum, the FCC should strive to simplify the process and minimize the burden on reverse auction participants. The Commission must balance this objective with the need to clear sufficient spectrum.

1. THE COMMISSION CAN ENCOURAGE BROADCASTER PARTICIPATION BY ADOPTING A DESCENDING CLOCK APPROACH THAT MINIMIZES THE BURDEN ON BROADCASTERS AND PROVIDES FLEXIBILITY

Although CEA does not have any direct interest in reverse auction design, it appears that the proposed descending clock design may be the best option to facilitate broadcaster participation.⁷⁵ If the comments and replies filed in the record reflect agreement that a descending clock auction, with the ability to submit proxy bids, is feasible (in light of the complexity of the repacking model and bid selection process running together during every phase of the auction), will simplify bidding, reduce costs, and provide flexibility to bidders, the Commission should adopt that auction design proposal. In addition, if the Commission adopts the descending clock auction design, it should start the auction with prices that are sufficiently high to generate significant broadcaster interest. This should help to maximize the amount of spectrum cleared. One benefit of the descending clock design is that, in contrast to a single round sealed bid auction, a descending clock auction would not require broadcasters to independently establish a one-time only offer price. Instead, under the descending clock

⁷⁵ NPRM, 27 FCC Rcd at 12373 ¶ 39.

mechanism, a broadcaster would have the option to accept or decline a series of offers from the FCC.⁷⁶ This would greatly reduce the burden of auction preparation. Further, if the FCC adopts its proxy bid proposal, where broadcasters could set a pre-determined limit below which they would not relinquish spectrum rights, this would enable broadcasters to participate in the auction without having to monitor each individual round of the descending clock auction, thus streamlining the process for the broadcasters and expediting the reverse auction.

2. WINNING BIDS SHOULD MAXIMIZE THE AMOUNT OF SPECTRUM CLEARED

The chosen assignment mechanism should identify winning bids that will best accomplish the primary goal of the Spectrum Act: repurposing the maximum amount of spectrum for mobile broadband use. The mechanism by which the FCC will determine which bids to accept in the reverse auction necessarily is complex. It is integrally related to whether and how the Commission weighs reverse auction bids and its ability to repack broadcast stations (taking into account shifts in broadcast licenses – such as channel sharing and channel moves – based on voluntary participation in the reverse auction). A successful reverse auction depends on a robust and quick bid selection process, working together with an efficient repacking mechanism. The Commission must carefully consider how to assign winning bids, as the chosen approach will be critically important to determining how much spectrum will be freed and available for the forward auction.

3. THE REPACKING PROCESS SHOULD NOT DELAY OR LIMIT THE TRANSITION OF 600 MHz SPECTRUM

Where questions regarding repacking may impact the amount of spectrum to be cleared, the timing of the auction, or the ultimate availability of the spectrum, the Commission must

⁷⁶ *Id.*

follow the language of the Spectrum Act and protect existing broadcast populations and areas served only to an extent that is “reasonable.”⁷⁷ Importantly, by requiring the FCC to make “all reasonable efforts,” the Spectrum Act does not require the FCC to “replicate” existing service areas and populations. Indeed, contrary to the approach the Commission took in the DTV Transition, the Spectrum Act prohibits the FCC from seeking to replicate existing service areas and populations in all circumstances by including the word “reasonable.” The FCC’s finding that broadcasters will likely see reductions of no more than two percent, similar to the DTV transition, is encouraging. However, there may be some situations in which reductions in services areas of more than two percent will occur, notwithstanding substantial FCC efforts to avoid such reductions. It is reasonable in such cases for the Commission to allow a greater than two percent change in contour or interference level if it is necessary to accomplish the primary objective of the Spectrum Act. Such limited circumstances must not be allowed to undermine the auction process or to preclude the FCC from achieving the larger goal of freeing up spectrum.

B. FORWARD AUCTION

To the extent the record reflects consensus by potential forward auction participants that an ascending clock auction design will facilitate a successful forward auction and not depress the revenues to be generated by the forward auction, the Commission should adopt the proposal.⁷⁸

⁷⁷ Spectrum Act § 6403(b)(2), 126 Stat at 226.

⁷⁸ An ascending clock auction is similar to a traditional simultaneous multiple round auction, but adds the new concepts of auctioning generic (non-frequency-specific) blocks, submission of intra-round bids at smaller price increments to balance spectrum supply and demand, and holding a subsequent bidding round for the assignment of specific frequencies. As the NPRM suggests, these new aspects of the auction could greatly speed up the forward auction process, which is important given the interdependence of the forward and reverse auctions. NPRM, 27 FCC Rcd at 12378 ¶ 61.

In addition, to the extent other rules and procedures that have been used in prior auctions (such as open eligibility for auction participation, activity rules to keep the auction proceeding expeditiously) can be used here to promote a robust and expeditious forward auction, the FCC should apply those rules. Since 1994, the FCC has conducted over 80 spectrum auctions that have raised more than \$50 billion for the U.S. Treasury. As a result, the FCC has developed substantial expertise in the design and implementation of spectrum auctions, and industry has gained significant experience from participating in those auctions. The FCC should seek to capitalize on knowledge gained from past auctions as it designs the forward auction here. The unique features of the forward auction in this case do not make it fundamentally different from previous spectrum auctions with respect to the application of certain procedures that have proved effective.

VII. EXPEDITED INTERNATIONAL COORDINATION IS NECESSARY TO ENCOURAGE MANUFACTURERS AND AVOID HAMPERING DEPLOYMENT

The Commission should move quickly to coordinate frequencies in the new 600 MHz band with Canada and Mexico. The Commission should consider creating a task force or similar working group dedicated to this coordination effort so that it does not become a gating factor in the incentive auction process. For CEA members, rapid coordination will help encourage manufacturers to build new devices – particularly with the potential for a larger market for possible sales, assuming interoperability across borders. More broadly, this coordination is necessary to finalize the grant of new licenses post-auction, because the Commission’s new band plan must be consistent with international treaties. In both the 800 MHz and 700 MHz transitions, the international coordination process slowed deployment. Although the Commission cannot control the timing of any action by the governments of Canada or Mexico,

early outreach by the Commission with full information to these governments will provide the best chance to minimize delay.

VIII. A STREAMLINED POST-AUCTION PROCESS WILL BRING SPECTRUM TO MARKET MORE QUICKLY

Based on its experience with the DTV Transition, the Commission should establish a streamlined and efficient post-auction process, with concrete milestones and hard deadlines, and should hold auction participants and new licensees to those milestones and deadlines. The DTV Transition demonstrated that deadlines and streamlined procedures (with the potential for enforcement) are necessary to effectuate industry-wide channel changes and spectrum clearing. Thus, prior to the incentive auction, the Commission should establish hard deadlines for broadcasters to clear any spectrum voluntarily relinquished in the reverse auction as soon as possible after completion of the auction.⁷⁹ There is no need for these stations to remain on the air in their previously assigned channels once the auction has closed and payments have been rendered. Quickly moving these reverse auction winners off the air will facilitate and expedite the subsequent changes that will have to be made by both reverse auction winners and repacked stations that remain on the air.

The Commission also should establish a hard deadline by which the broadcaster repacking process will be completed. These deadlines should be set in the Commission's rules, with clear restrictions on obtaining extensions and provisions to permit enforcement in the event of lack of compliance. By establishing a clear and efficient process, the Commission will provide certainty and clarity to participants in both the reverse and forward auctions, and enable forward auction winners to better plan for the construction of networks and the deployment of

⁷⁹ CEA intends to recommend a specific deadline to the Commission following development of the record in this proceeding and additional discussion with stakeholders.

mobile broadband services. Thanks to the DTV Transition, the Commission has substantial experience in addressing channel changes, shifts in coverage area and population, and other technical and operational transitions that will also be at issue here. The Commission's experience in guiding the DTV transition, as well as the fact that there is no analog-to-digital transition here (only digital-to-digital), should facilitate a quick and seamless transition to the new broadcast band for those stations that need to relocate involuntarily.

Likewise, the rules and procedures governing reimbursement for relocation expenses should fairly and timely reimburse broadcasters for their reasonable expenses, well in advance of the three-year timeframe during which relocation funding is available under the Spectrum Act. To the extent those reimbursements can occur early in the relocation process, *e.g.*, based on estimates or ranges of pre-approved equipment rates, such expedited reimbursement procedures could provide very necessary financial assistance to broadcasters who are relocated, and could allay broadcasters' fear and uncertainty about the process.

IX. CONCLUSION

This historic broadcast incentive auction unquestionably will foster innovation and benefit consumers, and the Commission should move forward expeditiously in its design, consistent with the foregoing comments.

Respectfully submitted,

CONSUMER ELECTRONICS
ASSOCIATION

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January 25, 2013