

BEFORE THE
Federal Communications Commission
WASHINGTON, D.C.

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

**REPLY COMMENTS OF COMCAST CORPORATION
AND NBCUNIVERSAL MEDIA, LLC**

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Comcast Corporation and NBCUniversal Media, LLC (“NBCUniversal”) (collectively, “Comcast”) hereby reply to comments filed in response to the Commission’s Notice of Proposed Rulemaking (“*Notice*”) in the above-captioned proceeding.¹

I. INTRODUCTION AND SUMMARY

The Commission has before it an important opportunity to implement an incentive auction framework that will provide the foundation for a wave of innovation, investment, and growth in broadcasting, mobile wireless broadband, and unlicensed services. The comments filed by over 200 parties reflect the breadth and complexity of the issues the Commission must address as it proceeds with this effort. On nearly every issue – from repacking, to the band plan, to reimbursement, to must-carry, to unlicensed spectrum, to the auctions themselves –

¹ *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd. 12357 (2012) (“*Notice*”).

commenters have strong opinions about what the Commission’s priorities should be, and how the Commission should move forward.

Fortunately, Congress already addressed many of these policy issues in the Spectrum Act.² In particular, it established a high bar for the repacking of broadcast spectrum – the Commission must “make all reasonable efforts” to protect broadcasters’ coverage areas and populations served. Congress also recognized the importance of, and expressly permitted the allocation of, unlicensed spectrum in the 600 MHz band. And Congress expressly preserved the Commission’s right to establish “technically reasonable” guard bands that could be allocated to uses that do not cause harmful interference to licensees. The Commission must adhere to these Congressional directives.

Some commenters advocate positions that either ignore or misread the Spectrum Act. For example, they ignore the word “all” in the phrase “all reasonable efforts” to rationalize a lax approach to repacking broadcasters who are involuntarily moved. Similarly, they argue that guard bands should be no larger than technically necessary, despite the fact that the statute explicitly says no larger than “technically reasonable,” in an effort to squeeze unlicensed services and wireless microphones out of the 600 MHz band. As Comcast explains in these reply comments, these policy issues have been debated and settled by Congress, and reviving them here is inappropriate and adds unnecessary layers of complexity to a task that is already among the most complex that the Commission has ever undertaken.

² Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6001 *et seq.* (2012) (“Spectrum Act”).

While there was debate in the comments on many issues, there was also consensus on several key issues. Most notably, nearly every party that commented on the approach the Commission should take with respect to the band plan supported some version of the “Down From 51” approach that Comcast supported in its initial comments. As commenters explained, this approach affords the Commission the best opportunity to meet the policy goals set forth by Congress, including protecting both broadcasters and mobile wireless providers from harmful interference, allocating sufficient spectrum to unlicensed uses, and ensuring that wireless microphones can continue to operate in the 600 MHz band. In light of this widespread agreement, the Commission should not hesitate to adopt the “Down From 51” band plan approach.

The record compiled in this proceeding confirms that the Commission’s task is daunting, but by adhering closely to the statute the Commission can best ensure that the incentive auction is a success.

II. THE COMMISSION’S APPROACH TO REPACKING MUST REFLECT THE SPECTRUM ACT’S DIRECTIVE TO “MAKE ALL REASONABLE EFFORTS” TO PRESERVE BROADCASTERS’ COVERAGE AREAS AND POPULATIONS SERVED.

Congress in the Spectrum Act emphasized the need to preserve the continued vitality of broadcasting while affording the Commission a historic opportunity to transition some broadcast spectrum to wireless broadband. Specifically, Congress expressly directed the Commission to “make all reasonable efforts” to preserve the specific population served and coverage area of each repacked broadcast licensee.³

³ Spectrum Act § 6403(b)(2).

Despite this clear mandate, and without regard for the Commission’s lengthy history of recognizing the importance of broadcasting to local communities, certain commenters proposed repacking broadcasters in a manner that fails in several key respects to meet Congress’s directive. To ensure a fair and successful auction and repacking process, the Commission should reject those proposals and, instead, should protect all valid construction permits or other Commission authorizations held by broadcasters to modify their stations or operate at variance from licensed parameters and should ensure that broadcasters are able to serve *the same* geographic coverage area and *the same* viewers post-auction as provided for under the current rules.

A. Licensees’ Granted Construction Permits and Other Authorizations Must Be Preserved as Part of the Commission’s Repacking Approach.

The Spectrum Act requires more than merely the preservation of particular *facilities*; instead, it requires the protection of “broadcast television *licensees*.”⁴ Numerous commenters agreed with Comcast that covering only “facilities that were licensed, or for which an application for license to cover authorized facilities was on file with the Commission, as of February 22, 2012,”⁵ falls short of what the statute mandates.⁶ As Comcast explained, this

⁴ See, e.g., Association of Public Television Stations, et al. Comments at 8-10; Belo Comments at 13-14; ABC Television Affiliates Ass’n, et al. (“Broadcast Affiliates”) Comments at 19-22; see also Spectrum Act § 6403(b)(2) (“[T]he Commission shall make all reasonable efforts to preserve, as of the date of the enactment of this Act, the coverage area and population served of *each broadcast television licensee*. . . .”) (emphasis added). Unless otherwise noted, all comments cited herein were filed in Docket No. 12-268.

⁵ Notice ¶ 98.

⁶ See, e.g., Broadcast Affiliates Comments at 23-24; Belo Corp. (“Belo”) Comments at 16-18; CBS Corp., et al. (“Broadcast Networks”) Comments at 8; Carolina Christian Broadcasting Comments at 1-3; Connecticut Public Broadcasting Comments at 1-3; Computer & Communications Industry Ass’n (“CCIA”) Comments at 12; Cox Media Group (“Cox”) Comments at 6-7; Dispatch Printing Comments (footnote continued...)

approach would only protect licensees that have reached the final stage of the process of modifying existing facilities, but the law directs the Commission to do more.⁷ The Commission must protect not only those stations with granted or pending licenses to cover, but also granted construction permits and other authorizations – built or unbuilt – as of February 22, 2012.

Moreover, the record supports Comcast’s position that the proposal contained in the *Notice* effectively would nullify the public interest determinations that the Commission already has made with respect to these authorizations.⁸ This result would be particularly harmful to stations that would suffer a loss in their coverage areas and populations served through no fault of their own.⁹ And, as many commenters demonstrated, this outcome would be fundamentally unfair to broadcasters with construction permits, many of whom have expended resources in reliance on the Commission’s granting of the permits.¹⁰ These licensees now face the prospect

(...footnote continued)

(“Dispatch”) at 3-4; LeSEA Broadcasting (“LaSEA”) Comments at 2-3; Named State Broadcaster Associations Comments at 14.

⁷ See Comcast Comments at 15.

⁸ See, e.g., Named State Broadcaster Associations Comments at 14 (arguing that protecting construction permits would “prevent[] the resolution of this proceeding from, in effect, nullifying [the Commission’s] prior actions in granting . . . construction permits based on public interest determinations”); Walt Disney Co. (“Disney”) Comments at 26 (“[I]t would be fundamentally unfair to fail to protect full-power facilities constructed in reliance on long-standing Commission rules and policies.”).

⁹ Such stations include those broadcasters in New York City that have been operating under grants of special temporary authority (“STA”) since the destruction of the World Trade Center in 2001. See Comcast Comments at 6 n.4; New York State Broadcasting Ass’n (“NYSBA”) Comments at 17 n.23; Disney Comments at 4 n.7.

¹⁰ See, e.g., Broadcast Affiliates Comments at 23-24 (“Stations that rely on the Commission’s normal processes should not be cast aside, nor should their financial investments be wasted, when the Spectrum Act requires no such thing.”); Belo Comments at 17 (“Excluding [pending or granted construction permits] would undermine the legitimate business expectations of broadcasters”); KRBK Comments at 2-3 (“During the construction of its DTS facilities, KRBK had no way of knowing
(footnote continued...)”)

of seeing the service improvements they have invested in and worked to implement left unprotected by the Commission, all without any notice or persuasive rationale – and inconsistent with what Congress plainly mandated.¹¹

The Commission can easily avoid this wholly unjustified outcome. As Comcast explained in its initial comments, protecting the coverage areas and populations served of broadcast stations subject to granted, but unbuilt, construction permits serves the public interest and promotes basic fairness for broadcasters that have complied with and relied on the Commission’s licensing processes. More importantly, it is the only result that comports with the Spectrum Act’s requirement that the Commission “make all reasonable efforts” to protect broadcasters during the repacking process.

B. The Commission Must – and Can – Replicate the Populations Served and Coverage Areas of Broadcasters That Are Involuntarily Repacked.

Certain commenters argue that the Commission should not bother exerting “all reasonable efforts” to replicate each repacked station’s coverage area and population served because doing so would be “impossible.”¹² This assertion would be true only if the Commission’s sole mandate in this proceeding were to replicate a repacked broadcast station’s

(...footnote continued)

the time constraints it was under to build out its facilities and apply for a license prior to February 22, 2012. Had KRBK known of the impending deadline, the company likely would not have invested over \$1.7 million and countless hours of labor toward completing a facility that might not be afforded protection.”).

¹¹ See, e.g., LaSEA Comments at 3 (“Arbitrarily cutting off protection for those permit holders is not only unfair, but diametrically opposed to the Spectrum Act’s mandate to preserve stations’ coverage areas and populations.”).

¹² United States Cellular Corp. (“U.S. Cellular”) Comments at 7 (“[P]recise coverage replication would be impossible given the fact that stations will be moving to new channels with different propagation characteristics.”); see also Consumer Electronics Ass’n (“CEA”) Comments at 32; CTIA – The Wireless Association (“CTIA”) Comments at 35.

transmitting frequency. However, frequency is just one of many parameters that combine to create a particular station's coverage area and population served.

There is no provision in the Spectrum Act – and the commenters suggesting the impossibility of full replication cite none – that requires the Commission to change this one aspect of a repacked station's facilities and then prohibit that station from compensating for that change by making small adjustments to other parameters, such as effective radiated power (“ERP”) and tower height.¹³ As several parties noted, allowing adjustments to ERP levels was an essential component of the DTV transition, enabling VHF broadcasters to replicate coverage area that otherwise would have been lost as part of that transition, and it must be part of the Commission's calculus here as well.¹⁴

Permitting similar changes during the repacking process in this proceeding is an equally important and reasonable step toward implementing Congress's goal of preserving repacked stations' existing coverage areas and populations served.¹⁵ In fact, to fully comply with the Spectrum Act, the Commission *must* permit such technical modifications to the extent necessary to replicate a station's existing coverage area and population served. As Comcast and other commenters explained, focusing on the total area, rather than the actual, precise coverage area,

¹³ See, e.g., Carolina Christian Broadcasting (“CCB”) Comments at 1-3 (discussing CCB's efforts to replicate existing coverage through increased ERP levels); Dispatch Comments at 1-3 (same); WGAL Hearst Television (“WGAL”) Comments at 6-8 (same).

¹⁴ See, e.g., Disney Comments at 14-17; WXXA-TV Comments at 2-4; Dispatch Comments at 2-3; WGAL Comments at 11-13.

¹⁵ See Letter from Senator Sherrod Brown, et al., Congress of the United States, to Hon. Julius Genachowski, Chairman, FCC, at 2 (Feb. 28, 2013) (“[D]uring the repacking of broadcasters, it will be important to minimize coverage area disruption.”).

disserves the public interest, ignores technical issues like terrain losses, and otherwise fails to meet the “all reasonable efforts” standard.¹⁶

C. Certain Commenters Support a Repacking Approach That Is Premised on a Flawed Reading of the Spectrum Act.

The language regarding repacking in the Spectrum Act – that the Commission must “make all reasonable efforts to preserve” stations’ existing coverage areas and populations served – reflects a deliberate and critically important policy choice made by Congress that the Commission may not simply ignore.¹⁷ In fact, Congress specifically *rejected* language that would have given the Commission substantially greater flexibility in repacking.¹⁸ As the *Notice* recognizes, “section 6403(b)(2) imposes significant technical constraints on the Commission’s repacking authority.”¹⁹

The plain language of the Spectrum Act evinces Congress’s intent to place limits on the Commission’s repacking discretion. As NAB explained, “Congress clearly intended that

¹⁶ See, e.g., Comcast Comments at 17-18; Anonymous Broadcast Licensees Comments at 2; Broadcast Affiliates Comments at 26-31; Broadcast Networks Comments at 5-7; Cox Comments at 2-3; Harris Corp. (“Harris”) Comments at 5-7; Lima Commc’ns Corp., et al. (“Block Stations”) Comments at 3; Named State Broadcasters Ass’n Comments at 13-14; Nat’l Ass’n of Broadcasters (“NAB”) Comments at 18-30; NYSBA Comments at 21-22; Post-Newsweek Stations, Inc. (“Post-Newsweek”) Comments at 1-3; Sinclair Broadcasting Group, Inc. (“Sinclair”) Comments at 14; Disney Comments at 34-35.

¹⁷ See Comcast Comments at 11-12; Block Stations Comments at 6 (“The Commission is not authorized to reclaim and re-auction spectrum at any cost. Its authority is limited to auctions that can be conducted while protecting the over-the-air television broadcasting system.”); Harris Comments at 5-7 (“In determining which proposals to incorporate into the final auction rules, the Commission must remember that Congress did not call for it to make ‘those efforts that are reasonably convenient’”); NYSBA Comments at 11 (“The directive to use ‘all reasonable efforts to preserve’ pre-repacking levels of television service cannot be construed to mean, ‘unless the Commission has other priorities.’”).

¹⁸ See Wireless Innovation and Public Safety Act of 2011, H.R. 3509, 112th Cong., § 302(b)(3)(B) (2011) (proposing to lower the “all reasonable efforts” standard to require only “technically feasible” steps that result in “substantially similar” service).

¹⁹ *Notice* ¶ 97.

broadcasters who choose not to participate in the incentive auction should not be harmed by any mandatory channel changes.”²⁰ Certain commenters, however, urge the Commission to disregard those limits and instead chart a course that would permanently and irreparably impair the ability of broadcasters to continue serving their local communities. The Commission must reject proposals that pretend that the word “all” does not exist in the phrase “all reasonable efforts.”²¹ Verizon, U.S. Cellular, AT&T, and CTIA – The Wireless Association (“CTIA”) all suggest that the Commission’s burden is merely to make “reasonable efforts” regarding its repacking obligations.²² But this interpretation is wrong on its face, and these parties offer no explanation for why only two-thirds of the statutory phrase should be given effect. Meanwhile, other commenters suggest that the Commission should be guided not by the standard set by Congress, but by the alternative goal of “repacking efficiency,”²³ a target that ignores the statute

²⁰ NAB Comments at 49.

²¹ See Notice ¶ 105 (“[T]he standard that the Commission adopts must *reasonably* preserve each station’s ‘population served’ under all of the circumstances involved.”) (emphasis added). See also Cox Comments at 2-3 (“[W]hile the Spectrum Act directs the Commission to design a repack that will be predicted to preserve current service, the Commission proposes to interpret the statute to permit ‘reasonable’ loss of service.”).

²² See Verizon Comments at 36 (“The Spectrum Act also requires that the Commission take ‘reasonable efforts’ to preserve the broadcasters’ coverage areas and population served.”); U.S. Cellular Comments at 7 (arguing that Congress “creat[ed] a flexible ‘reasonable efforts’ standard”); AT&T Comments at 76-77 (arguing that “the ‘reasonable efforts’ standard gives [the Commission] great flexibility to perform repacking”); CTIA Comments at 35 (“While the Commission can and should take ‘reasonable’ steps to ensure licensees can generally replicate their coverage, requiring precision in this area is not required by the Spectrum Act . . .”). Although AT&T at least quotes the relevant provision in full – unlike Verizon and U.S. Cellular – it reduces the standard that it argues should ultimately guide the Commission’s efforts to merely “reasonable efforts.” See AT&T Comments at 76-77.

²³ See Telecomms. Indus. Ass’n (“TIA”) Comments at 7 (“Where it would facilitate repacking efficiency, reductions of up to 2 percent of a TV station’s geographic coverage area would be *de minimis* and therefore should be deemed reasonable.”); see also AT&T Comments at 10 (urging the Commission to avoid an “unacceptable loss of repacking efficiency”).

altogether. Such interpretations of the Spectrum Act cannot be reconciled with Congress's specific decision not to give the Commission additional discretion during the repacking process.

The Commission should reject these flawed interpretations of the standard governing the scope of its discretion. Congress' directive was to protect broadcasters, and parties that urge the Commission to consider that as simply one factor out of many are effectively urging the Commission to adopt an approach that is entirely unmoored from the statute. As Comcast and others have explained, neither judicial nor Commission precedents have interpreted the phrase "all reasonable efforts" as incorporating any sort of balancing test.²⁴ To the contrary, this standard requires the Commission to perform a significantly simpler task: focus exclusively on preserving the integrity of broadcasters' existing coverage areas and populations served.

There can be no doubt that the repacking process represents a daunting task. But the Commission must perform it within the bounds of the limited discretion afforded to it under the Spectrum Act. Only by doing so can the Commission ensure the continued ability of broadcasters to serve their local communities.

III. THE SPECTRUM ACT REFLECTS A WIDESPREAD CONSENSUS THAT UNLICENSED SPECTRUM IN THE 600 MHZ BAND MUST BE A PART OF THE COMMISSION'S SPECTRUM MANAGEMENT APPROACH.

As Comcast explained in its initial comments, the Commission must take advantage of this opportunity to expand the amount of spectrum available for unlicensed services, such as Wi-Fi.²⁵ It is indisputable that consumers are increasingly relying on robust wireless broadband services in nearly every aspect of their daily lives. To meet skyrocketing demand, the

²⁴ See Comcast Comments at 12-14; Harris Comments at 5-7; NYSBA Comments at 11; Parker Broadcasting of Louisiana Comments at 4.

²⁵ See generally Comcast Comments at 29-45.

Commission’s approach to spectrum management should foster the growth of *both* licensed *and* unlicensed services.

While the Commission should be commended for its current efforts to expand the availability of unlicensed spectrum in other bands, it is crucial that sufficient unlicensed spectrum also be made available in the 600 MHz band. And as Comcast explained and the record demonstrates,²⁶ such an approach is consistent with the Spectrum Act, wherein Congress recognized that services operating in unlicensed bands are necessary complements to licensed services and, accordingly, gave the Commission sufficient authority to allocate significant amounts of spectrum in the 600 MHz band for unlicensed use.

A. Commenters Agree on the Important Role That Unlicensed Services Must Play in Addressing Increasing Demand for Wireless Broadband Services.

The record unambiguously demonstrates that demand for wireless data services is increasing at a rapid rate.²⁷ The explosion of data consumed over wireless networks has been nothing short of remarkable and shows no signs of slowing. In fact, as Commissioner McDowell recently noted, mobile data traffic increased 62% in 2012 compared to the prior year, with

²⁶ See *id.* at 42-44.

²⁷ See, e.g., Research in Motion Comments at 3 (“U.S. mobile data traffic grew at almost 300% last year and is projected to grow an additional 16-fold by 2016 – driven by 4G LTE smartphones and tablets.”); High Tech Spectrum Coal. Comments at 2-3 (“In 2011, 4% of users were generating more than 1 gigabyte of mobile data. By 2016, 74% will generate that much data. Today’s smartphones consume 14 times more data than a basic handset.”); Google and Microsoft Joint Comments at 5 (“Cisco’s Virtual Networking Index found that traffic from devices connecting to the network via Wi-Fi represented 37 percent of *all* IP traffic in the United States in 2011.”); Motorola Mobility LLC (“Motorola Mobility”) Comments at 5-6 (“[T]he amount of traffic offloaded from cellular networks to Wi-Fi in the United States doubled between 2011 and 2012. And the amount of data traffic from Wi-Fi offload is expected to increase 16-fold between 2011 and 2016. . . .”); Nokia Siemens Networks Comments at 5 (“Nokia Siemens Networks anticipates that by 2020 a typical user could be consuming a gigabyte (GB) of data per day.”).

mobile data networks handling more than 207 petabytes of data.²⁸ Within five years, mobile data usage is expected to be *nine times higher* than it is today.²⁹

Commenters representing a diverse set of interests also recognized that, in order to handle this explosion in data usage, robust unlicensed services – particularly Wi-Fi – must continue to be an integral part of the equation. Free Press pointed out that unlicensed spectrum is responsible for carrying the majority of the world’s Internet data and has “substantially enhanced the economic value of both fixed and mobile broadband offerings.”³⁰ CTIA recognized the essential role that unlicensed services play in complementing licensed mobile services and noted that Wi-Fi is expected to handle half of all wireless data five years from now.³¹ In their joint comments, Google and Microsoft noted the importance of “access to robust licensed services as well as access to robust unlicensed spectrum resources” and demonstrated that a “balanced approach” between licensed and unlicensed services has served consumers and the country well.³² Motorola Mobility urged the Commission to “promote spectrum for unlicensed uses” because the “insatiable demand for broadband data by consumers can only be satisfied through a

²⁸ Statement of Commissioner McDowell, *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, ET Docket No. 13-49, FCC 13-22, at 1 (rel. Feb. 20, 2013) (“*McDowell 5GHz Statement*”) (citing *VNI Mobile Forecast Highlights, 2012-2017, United States – 2012 Year in Review*, Cisco Systems, http://www.cisco.com/web/solutions/sp/vni/vni_mobile_forecast_highlight/index.html (last visited March 13, 2013)).

²⁹ *Id.*

³⁰ Free Press Comments at 11-12.

³¹ CTIA Comments at 7.

³² Google and Microsoft Joint Comments at 1, 3.

holistic policy framework that encourages the combined efforts of wide-area access provided by wireless carriers as well as robust, small-cell access provided by unlicensed Wi-Fi devices.”³³

In short, the record is clear that licensed and unlicensed services are complementary services.³⁴ Therefore, as Comcast explained in its initial comments, the Commission must ensure that it designs the incentive auction in a manner that allocates enough spectrum for unlicensed use – at least 20 MHz – to permit the continued growth of robust Wi-Fi and other unlicensed services.³⁵

B. The Commission Should Increase the Amount of Unlicensed Spectrum Available Across a Number of Spectrum Bands – Including the 600 MHz Band.

Recognizing the critical importance of unlicensed services, the Commission has undertaken a number of efforts to allocate additional spectrum for unlicensed use.³⁶ Comcast supports these initiatives and applauds the Commission for taking action to address an urgent need. The Commission’s work, however, is just beginning.³⁷

³³ Motorola Mobility Comments at 3.

³⁴ See Public Interest Spectrum Coalition Comments at 10 (“[I]t’s increasingly clear that unlicensed spectrum is not in competition with – but rather complementary to – licensed services.”).

³⁵ The IEEE 802.11 Wi-Fi standards in use today in devices relied on by millions of consumers operate on 20 MHz-wide channels, which makes 20 MHz the minimum amount of spectrum generally considered necessary for the provision of broadband speeds via a Wi-Fi network. See Comcast Comments at 30 n.79. Other commenters urge the Commission to allocate even more spectrum for unlicensed uses. For example, Google and Microsoft advocate a 28 MHz duplex gap that should be allocated to unlicensed uses. Google and Microsoft Joint Comments at 37.

³⁶ See, e.g., *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, ET Docket No. 13-49, FCC 13-22 (rel. Feb. 20, 2013).

³⁷ Moreover, the Commission cannot assume the outcome of these proceedings. For example, recent NTIA analysis suggests that the Commission’s 5 GHz proceeding may be affected by the interference concerns of government users. See Letter from Lawrence E. Strickling, Asst. Sec’y for (footnote continued...)

As the record demonstrates, the existing spectrum bands set aside for unlicensed uses are increasingly congested, which threatens the continued robustness of these services.³⁸ Chairman Genachowski has correctly observed that “Wi-Fi congestion is a very real and growing problem.”³⁹ Commissioner McDowell noted that “spectrum that is used for unlicensed Wi-Fi is also experiencing congestion, which will only increase in the coming years.”⁴⁰ Commissioner Clyburn accurately points out that the existing 2.4 GHz unlicensed band is particularly congested in major cities,⁴¹ and Commissioner Rosenworcel has labeled that band as “mighty crowded.”⁴² The problem is clear.

To address this looming capacity shortfall, numerous commenters agree with Comcast that the Commission should make available sufficient unlicensed spectrum in the 600 MHz band. With demand for wireless data services increasing at an astonishing rate, the Commission’s recent initiatives with respect to the 3.5 GHz and 5 GHz bands represent necessary, but not

(...footnote continued)

Comm’n & Info., U.S. Dep’t of Commerce to Hon. Julius Genachowski, Chairman, FCC, ET Docket No. 13-49 (Feb. 19, 2013).

³⁸ See, e.g., Comcast Comments at 37-40; Google and Microsoft Joint Comments at 25; NCTA Comments at 3; Wi-Fi Alliance Comments at 1.

³⁹ Statement of Chairman Genachowski, *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, ET Docket No. 13-49, FCC 13-22, at 1 (rel. Feb. 20, 2013).

⁴⁰ *McDowell 5GHz Statement* at 1-2.

⁴¹ Statement of Commissioner Clyburn, *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, ET Docket No. 13-49, FCC 13-22 (rel. Feb. 20, 2013) (“*Clyburn 5 GHz Statement*”).

⁴² Statement of Commissioner Rosenworcel, *Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band*, Notice of Proposed Rulemaking, ET Docket No. 13-49, FCC 13-22, at 1 (rel. Feb. 20, 2013) (“*Rosenworcel 5 GHz Statement*”).

sufficient, steps.⁴³ CCIA stressed that “diversity of spectrum allocation must remain a key tenet of the Commission’s policy. At this point in the nation’s development of a wireless marketplace, it is simply a truism that different applications require different types of spectrum.”⁴⁴

Commissioner Rosenworcel correctly described the proposals in the 5 GHz NPRM as “good first steps.”⁴⁵ This proceeding provides a prime opportunity for the Commission to sensibly bolster its efforts to ensure that the unlicensed economy continues to thrive, unencumbered by capacity constraints.

In addition to addressing congestion issues, the record supports Comcast’s position that the unique propagation and other characteristics of spectrum in the 600 MHz band make it essential that Commission allocate at least 20 MHz of spectrum in this proceeding for unlicensed use. A primary benefit is the enhanced geographic coverage of low-frequency spectrum, which would permit Wi-Fi networks to cover a much more expansive area.⁴⁶ Google and Microsoft concisely summarized other benefits of making unlicensed spectrum available at various frequency levels, including in the 600 MHz band:

⁴³ See e.g., Comcast Comments at 29-30; Free Press Comments at 10 (“[The] Commission’s recent proposal to open up 195 MHz of spectrum in the 5 GHz band is a welcome development, but not an adequate substitute for setting aside unlicensed spectrum in the 600 MHz band.”).

⁴⁴ CCIA Comments at 10.

⁴⁵ *Rosenworcel 5 GHz Statement* at 1.

⁴⁶ See, e.g., CCIA Comments at 11 (“Lower frequency spectrum ‘allow[s] for better coverage across larger geographic areas and inside buildings,’ thus filling a substantial need in the market for wireless connectivity indoors, outdoors, and next door.”) (quoting *Policies Regarding Mobile Spectrum Holdings*, Notice of Proposed Rulemaking, 27 FCC Rcd. 11710 ¶ 35 (2012)); NCTA Comments at 4 (explaining that unlicensed services in the 600 MHz band will allow “consumers to access Wi-Fi regardless of whether they are indoors or outdoors, and allowing both short-range and long-range access to Wi-Fi networks”); Wi-Fi Alliance Comments at 1-2 (noting the potential for improved Wi-Fi coverage).

[H]aving access to high, middle, and low-frequency unlicensed bands will provide innovators far greater flexibility in designing equipment to enable a wide range of use cases. This will give engineers access to less expensive components that operate at a lower power on lower frequencies, where line-of-sight operations are not possible and where interference must be avoided, and at higher power in higher-frequency bands, permitting focused point-to-point communications. Finally, unlicensed devices operating in the broadcast bands require less power for a given range and throughput, which increases battery life and reduces operating costs.⁴⁷

Thus, as the record demonstrates, it simply makes good policy sense to embrace a holistic, strategic approach to unlicensed spectrum that includes at least 20 MHz of spectrum in the 600 MHz band. That outcome will ensure the continued development of robust services that will support consumers and providers alike.

C. The Spectrum Act Gives the Commission Sufficient Flexibility to Incorporate Unlicensed Spectrum in the 600 MHz Band.

As Comcast explained in its comments,⁴⁸ when drafting the Spectrum Act Congress clearly recognized the important role that unlicensed services play in meeting rising wireless data demand. There was general consensus among the commenters that Congress gave the Commission flexibility to allocate spectrum in the guard bands and the duplex gap for unlicensed use.

For example, CCIA noted that Congress deliberately empowered the Commission to establish a duplex gap and guard bands that are “technically reasonable,” which requires the Commission to exercise its “expert discretion.”⁴⁹ NCTA pointed out that “Congress could have,

⁴⁷ Google and Microsoft Joint Comments at 24-25.

⁴⁸ See Comcast Comments at 42-44.

⁴⁹ CCIA Comments at 3.

but did not, limit the Commission to using ‘minimum’ or ‘technically necessary’ guard bands.”⁵⁰ Free Press echoed this sentiment: “In enacting the Spectrum Act, Congress thus left many decisions to the Commission, including whether to use guard bands for unlicensed use and how to determine the appropriate size of such guard bands.”⁵¹ The Commission can act on solid statutory authority and with substantial record support in allocating spectrum for unlicensed services.

Despite the Commission’s clear authority on this issue, some commenters argued that the Commission must overcome a high threshold to justify allocating any spectrum to unlicensed uses.⁵² These commenters offer no statutory support for these assertions and, in fact, they cannot do so because such assertions are contrary to the clear and unambiguous language in the Act. Other commenters argue that financial considerations limit the Commission’s flexibility regarding the allocation of spectrum for unlicensed use, asserting that the Commission must focus on maximizing auction revenue.⁵³ But, as Comcast explained in its initial comments, the Commission cannot take auction revenues into account as part of its considerations in this proceeding.⁵⁴

⁵⁰ NCTA Comments at 13.

⁵¹ Free Press Comments at 7.

⁵² *See, e.g.*, Cisco Comments at 13.

⁵³ *See, e.g.*, Cellular South Comments at 8; CTIA Comments at 12; Sprint Nextel Comments at 12.

⁵⁴ *See* Comcast Comments at 43; *see also* 47 U.S.C. § 309(j)(7)(A) (prohibiting the Commission from “bas[ing] a finding of public interest, convenience, and necessity on the expectation of Federal revenues”).

Moreover, as a number of commenters correctly noted, solely considering auction revenue is “shortsighted” for several reasons.⁵⁵ Such a myopic focus ignores legitimate considerations about meeting future mobile data needs. The economy will suffer if the Commission fails to meet such needs through a balanced and forward-looking approach to spectrum policy, an outcome that clearly would be inconsistent with the intent of the Spectrum Act. The record documents the massive positive impact that unlicensed services have on the American economy, contributing upwards of \$50 billion in annual economic growth.⁵⁶

IV. THE RECORD REFLECTS WIDESPREAD SUPPORT FOR A FLEXIBLE BAND PLAN THAT ALLOWS THE COMMISSION TO IMPLEMENT MULTIPLE POLICY GOALS.

One of the central components of the Commission’s efforts to implement the Spectrum Act’s objectives is the design of the 600 MHz band plan. As Comcast noted in its initial comments, the Commission’s band plan must be designed to achieve a number of important priorities, including to protect mobile broadband operations and broadcasters from harmful interference, to allocate sufficient spectrum for unlicensed uses, and to ensure the continued operation of wireless microphones.⁵⁷ Comcast demonstrated that a version of the “Down From 51” band plan set forth in the *Notice* put the Commission in the best position to accommodate these, and other, goals.⁵⁸

⁵⁵ See, e.g., Free Press Comments at 10; Consumers Federation of America Comments at 5; Google and Microsoft Joint Comments at 28.

⁵⁶ See *Clyburn 5 GHz Statement*.

⁵⁷ See Comcast Comments at 20-23.

⁵⁸ See *id.*

Comcast was not alone in reaching this conclusion. Commenters representing nearly every sector with an interest in this proceeding favored the “Down From 51” approach.⁵⁹ Broadcasters and wireless providers agreed that the “Down From 51” approach would reduce interference concerns for both sectors. Advocates for unlicensed spectrum agreed that this approach gives the Commission the best opportunity to allocate sufficient spectrum for unlicensed use. And the “Down From 51” band plan allows the Commission to preserve sufficient spectrum for ensuring the continued operation of wireless microphones. In light of this overwhelming record support, the “Down From 51” band plan should form the basis of the Commission’s actions moving forward.

A. The “Down From 51” Band Plan Is Best Suited for Protecting Both Broadcasters and Mobile Wireless Providers from Harmful Interference.

One of the Commission’s top priorities in this proceeding is to ensure that broadcasters and mobile broadband providers can operate without harmful interference.⁶⁰ As Comcast and others concluded in the initial comments, the “Down From 51” band plan is the approach that best meets this goal.⁶¹

Commenters identified a number of “significant challenges” presented by the Commission’s band plan proposal to have broadcasters operate in the duplex gap between the

⁵⁹ See, e.g., AT&T et al. Joint Letter at 1 (urging the Commission to adopt “a contiguous ‘down from TV 51’ approach with uplink at the top”).

⁶⁰ *Id.*

⁶¹ See, e.g., Comcast Comments at 20-22; Belo Comments at 18; Broadcast Affiliates Comments at 43-46; Broadcast Networks Comments at 9-10; NAB Comments at 45-47; NCTA Comments at 4, 16-17; Sony Comments at 4; Sprint Nextel Comments at 22; WhiteSpace Alliance Comments at 25.

mobile broadband uplink and downlink frequencies.⁶² The primary concern is the split nature of the band plan, and the fact that broadcasters operating in the duplex gap increases the likelihood of causing harmful interference for all licensees.⁶³ For example, T-Mobile noted that “the introduction of high-power broadcast operations within the duplex gap appears to create a substantial risk of harmful interference to broadband operations and broadcast incumbents.”⁶⁴ Verizon explained that “leaving broadcast operations in the duplex gap will increase the risk of harmful interference against which current mobile device and base station filter technology cannot protect.”⁶⁵ And AT&T cautioned that “placement of multiple television stations in the duplex gap could cause substantial interference in the 600 MHz, 700 MHz, and PCS receive bands and substantially degrade mobile operations in those bands.”⁶⁶

Broadcasters echoed this concern. NAB noted that leaving broadcast operations in the duplex gap would present “a number of serious technical difficulties” that would increase interference to both broadcasters and wireless operators, and weaken broadcaster innovation.⁶⁷

⁶² T-Mobile Comments at 8.

⁶³ *See, e.g., id.*; Verizon Comments at 19; NAB Comments at 34. Another issue parties identified was that variable amounts of spectrum in different markets assigned to mobile broadband operations vis-a-vis broadcast operations could cause “co- and multiple adjacent channel interference to TV reception in those adjacent markets.” NAB Comments at 40; *see also* CTIA Comments at 23. Addressing this issue would necessitate spectrally inefficient protection zones. *See* NAB Comments at 40 (“The current DTV protection criteria require mobile units to be located a minimum of 161 km (100 miles) from a co-channel TV station and must operate at least 8 km (5 miles) outside the contour of an adjacent channel TV station. At a minimum, such protection would be required under the proposed variable uplink band plan.”).

⁶⁴ T-Mobile Comments at 8.

⁶⁵ Verizon Comments at 19.

⁶⁶ AT&T Comments at 25.

⁶⁷ NAB Comments at 34-35. Other broadcasters concluded that “[a] split band plan harms both broadcast television service and wireless service.” Broadcaster Affiliates Comments at 44; *see also* Harris Comments at 24-26.

Specifically, NAB explained that broadcast operations in the duplex gap would result in “unresolvable intermodulation interference” and “out-of-band emissions interference.”⁶⁸

Equipment makers also recognized that “[t]he [Commission]’s leading proposed band plan . . . raises interference concerns for both television receivers and mobile devices.”⁶⁹ In particular, Sony noted that “[t]he [Commission]’s primary proposed band plan would introduce unnecessary complexity in both television and wireless broadband receiver design, thereby increasing receiver cost and diminishing reliability.”⁷⁰

The “Down From 51” plan supported by Comcast and numerous other parties in the initial comments addresses many of these concerns. Broadcasters explained that this approach will minimize interference and promote spectral efficiency, and allows nearly all interference concerns to be addressed “simply by providing an ample guard band to separate the services.”⁷¹ CTIA, AT&T, and Verizon proposed band plans that are built on the basic concepts set forth in the “Down From 51” band plan.⁷² And equipment manufacturers agreed that this approach

⁶⁸ NAB Comments at 35-36.

⁶⁹ CEA Comments at 25. *See also* Alcatel-Lucent Comments at 14 (arguing that “[t]he band plan should include a duplex gap with no TV channels interspersed with wireless operations” because of interference potential).

⁷⁰ Sony Comments at 2-3. Qualcomm provided more detail, explaining that the lead proposal “cannot be supported via a single antenna system (as is the case with mobile operations in other bands) because the required instantaneous antenna bandwidth, which exceeds 100 MHz, is too great. Adding an additional antenna into smartphones and tablets to support this band increases device size, complexity, and cost, and thus introduces potentially insurmountable design challenges given consumer demand for wireless devices with smartphone-sized form factors.” Qualcomm Comments at 6.

⁷¹ NAB Comments at 45.

⁷² CTIA Comments at 22 n.68 (“This proposal is similar to the “Down from Channel 51” alternate band plan proposal articulated by the Commission at paragraphs 178-179.”); AT&T Comments at 32 (illustrating how different versions of a band plan that start at channel 51 and work down from there “strike[s] a better balance among the [Commission]’s core objectives”); Verizon Comments at 5 (“[T]he
(footnote continued...)”)

“would greatly simplify the design of filters for both televisions and for mobile handsets.”⁷³ In a proceeding affecting many diverse interests and parties, it is remarkable that there is such a strong consensus in favor of one band plan.

B. The “Down From 51” Band Plan Facilitates the Allocation of Sufficient Unlicensed Spectrum.

The “Down From 51” band plan provides the Commission with a means to achieve another important public policy goal described in detail above: allocating sufficient spectrum to unlicensed use.⁷⁴ As NCTA explained, this plan has two benefits: (1) “it would make the spectrum recovered in a reverse auction more valuable by providing greater interference protection for mobile and broadcast services;” and (2) “adoption of an adequately sized duplex gap would provide universal, contiguous spectrum for unlicensed use, allowing the operation of a broad range of unlicensed mobile devices.”⁷⁵

As Comcast explained in its initial comments, if the Commission adopts the “Down From 51” band plan approach, it could then designate a “technically reasonable” duplex gap of at least 20 MHz and allocate that spectrum for unlicensed use, thereby satisfying the twin goals of

(...footnote continued)

Commission should make clearing DTV broadcast operations from Channels 38 through 51, and reallocating those channels to paired spectrum blocks for mobile uses, its primary goal, with supplemental downlink below Channel 37.”).

⁷³ Sony Comments at 4. *See also* Motorola Mobility Comments at 9-10 (“[B]y removing the television broadcast operations from the spectrum between the uplink and downlink bands, the alternative proposal would eliminate the source of intermodulation products that would otherwise fall into the downlink receive band and therefore interfere with wireless broadband devices.”).

⁷⁴ *See supra* Section III.

⁷⁵ NCTA Comments at ii; *see also* NAB Comments at 45 (noting that the “Down From 51” band plan also permits the use of a duplex gap for unlicensed use). Commenters also supported the “Down From 51” band plan because it “increases the potential availability . . . for white space device use.” WhiteSpace Alliance Comments at 25.

maximizing usable licensed spectrum and also unleashing a wave of innovation in unlicensed wireless services, such as Wi-Fi. Other commenters agreed with this approach. “A band plan that enables unlicensed operations in the duplex gap is the best way to meet the FCC’s goal of making as much unlicensed spectrum as possible available on a ‘nationwide basis.’”⁷⁶ Verizon also supported using the duplex gap for unlicensed operations that are properly designed not to cause harmful interference to licensed operations.⁷⁷

Importantly, comments by various parties strongly support Comcast’s position that a duplex gap of at least 20 MHz is “technically reasonable.”⁷⁸ Verizon noted that “[a] larger duplex gap results in less insertion loss and also facilitates a larger pass band of 25 MHz or possibly more without impacting sensitivity in the mobile device.”⁷⁹ Google and Microsoft note that a smaller duplex gap may lead to performance loss that “would be felt throughout the network, potentially reducing system capacity.”⁸⁰ Motorola Mobility explained that “[c]urrent 3GPP specifications for LTE frequency bands under 1 GHz provide for duplex gaps of varying sizes ranging from 10 MHz to 30 MHz, with an *average separation of approximately 19 MHz*.”⁸¹ If the *average* duplex gap for LTE frequencies under 1 GHz is 19 MHz, a duplex gap of at least

⁷⁶ Google and Microsoft Comments at 33.

⁷⁷ See Verizon Comments at v (noting that the duplex gap “can accommodate appropriate low-power devices but not broadcast stations.”).

⁷⁸ Even AT&T, Verizon, and CTIA assert that the *minimum* size of the duplex gap must be 10 MHz. AT&T Comments at 34; CTIA Comments at 28; Verizon Comments at 18; AT&T et al. Joint Letter at 2.

⁷⁹ Verizon Comments at 18.

⁸⁰ Google and Microsoft Comments at 38. As a result, they conclude that a duplex gap of 28 MHz is technically reasonable because it “allows the use of filters that reduce desired signal levels less and support better performance, without driving up the cost of devices.” *Id.*

⁸¹ Motorola Mobility Comments at 11 (emphasis added).

20 MHz is certainly “technically reasonable.” The Commission has the opportunity to implement a policy that not only comports with the statute but also accomplishes positive outcomes for both licensed and unlicensed wireless services.

C. The “Down From 51” Band Plan Allows the Commission To Ensure the Continued Operation of Wireless Microphones in the Band.

Comcast and other commenters noted in the initial round of comments that licensed wireless microphones and other low power devices are used extensively and continue to play an important role in allowing broadcasters to serve their communities.⁸² Given the continued importance of these devices, finding sufficient spectrum to ensure the interference-free operation of these devices moving forward is a critical public policy objective. Because the “Down From 51” band plan is more spectrally efficient than the Commission’s lead band plan proposal, it affords the Commission greater flexibility to find spectrum for wireless microphone operations.

In particular, the Commission should preserve at least two reserved channels between mobile broadband operations and broadcast operations for wireless microphone operations. These two channels would constitute the guard band between mobile broadband operations and broadcast operations.⁸³ If the Commission adopts a band plan that allocates a sufficient amount of spectrum in the duplex gap for unlicensed use,⁸⁴ supporting wireless microphones is an ideal

⁸² See, e.g., Comcast Comments at 22-23; AT&T et al. Joint Letter at 6-9; Broadcast Networks Comments at 10-12; Collective Wireless Microphone Interests Comments at 2-3; Disney Comments at 40-47; NAB Comments at 47; Society of Broadcast Engineers Comments at 1-14.

⁸³ Based on the current record, a 12 MHz guard band would appear to be “technically reasonable.” For example, Alcatel-Lucent suggests that the guard band should be at least 10 MHz. Alcatel-Lucent Comments at 11. And AT&T noted that “a six-megahertz guard band—the size proposed in the NPRM—would be insufficient to protect mobile broadband devices against downlink interference from a 1 MW TV station.” AT&T Comments at 22.

⁸⁴ See *supra* Section IV.B.

use for the guard band. As an initial matter, such an approach satisfies the Spectrum Act’s requirement that the Commission “not permit any use of a guard band that the Commission determines would cause harmful interference to licensed services.”⁸⁵ As Verizon noted, “[a]ppropriate low-power Part-15 type devices could operate in the guard band and the duplex gap” without causing or receiving harmful interference.⁸⁶ And allocating this spectrum to wireless microphones fulfills the Commission’s general mandate, as set forth in the Communications Act, to “encourage the larger and more effective use of radio in the public interest.”⁸⁷

To the extent the Commission decides not to preserve the two reserved channels for wireless microphones, Comcast agrees with NAB that the Commission should take other steps to improve protections for wireless microphones.⁸⁸ As NAB notes, the reserve channels “are essential to provide protection for licensed wireless microphone operations, and a reduction or elimination of the safe harbor framework should be accompanied by a corresponding increase in other forms of protection.”⁸⁹ For example, the Commission could develop a system whereby wireless microphones are prioritized over other TV White Spaces uses.⁹⁰ NAB suggests that the Commission could also address potential concerns by “requir[ing] TV band devices to check the

⁸⁵ Spectrum Act § 6407(e).

⁸⁶ Verizon Comments at 20.

⁸⁷ 47 U.S.C. § 303(g).

⁸⁸ NAB Wireless Microphone Comments at 6-7.

⁸⁹ *Id.* at 7.

⁹⁰ The Commission already has a system in place, in the form of the White Space databases, that it could use to accomplish this task. *See Unlicensed Operation in the TV Broadcast Bands*, Second Memorandum Opinion and Order, 25 FCC Rcd. 18661 ¶¶ 9-10 (2010).

database every twenty minutes instead of every 24 hours”⁹¹ These and other options to ensure the continued viability of wireless microphones are available to the Commission, but only if it adopts the “Down From 51” band plan.

* * * * *

In this proceeding, the Commission must develop a band plan that allows it to achieve a number of different policy goals, including preserving repacked broadcasters’ coverage areas and populations served, allocating sufficient spectrum for unlicensed use, and ensuring the continued viability of wireless microphones. The record reflects a widespread consensus that the “Down From 51” band plan is the only approach that allows the Commission to meet all these goals.

⁹¹ NAB Wireless Microphone Comments at 9.

V. CONCLUSION

For the reasons described herein, the Commission should take the following actions in this proceeding: (1) adhere to the Spectrum Act’s directive to “make all reasonable efforts” to preserve broadcasters’ coverage areas and populations served; (2) provide adequate spectrum for Wi-Fi and other unlicensed uses in the 600 MHz Band; and (3) adopt the “Down From 51” band plan, because it is the approach that best meets Congress’s key statutory objectives to protect both broadcasters and mobile wireless providers, allocate spectrum to unlicensed uses, and ensure the continued operation of wireless microphones in the band.

Respectfully submitted,

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