
Roadmap for a Voluntary Incentive Auction of Educational Spectrum in the 2.5 GHz Band

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I. Executive Summary

It has been sixty years since Ronald Coase developed his titular theorem while considering whether the allocation of spectrum resources should be determined by market forces rather than government predictions.¹ The once novel idea of harnessing the power of competitive bidding (i.e., auctions) to allocate spectrum rights has since become the norm for assigning spectrum licenses at the Federal Communications Commission (FCC) and throughout the world. After years of success with auctions, the FCC has repeatedly concluded that competitive bidding is a more efficient mechanism for licensing spectrum than “any previously employed methods.”² The FCC has nevertheless proposed to grant new Educational Broadband Service (EBS) licenses suitable for next-generation 5G services using “filing windows,” one of the “previously employed” methods for allocating spectrum rights that are less efficient than auctions.

This paper concludes that the FCC should instead hold a voluntary incentive auction to assign new licenses for the EBS “white spaces” and spectrum reclaimed from incumbent EBS licensees, because:

- **An incentive auction would maximize the educational value of EBS spectrum by converting the leasing scheme’s implicit and inefficient subsidy into an explicit needs-based subsidy for educational broadband.**

The implicit subsidy in the EBS leasing scheme is economically inefficient, largely duplicative of the agency’s E-rate program for subsidizing educational broadband connections, and conducive to waste, fraud, and abuse.

EBS licensees have lower incentives and less expertise in managing valuable spectrum resources than commercial wireless operators, and the broadband benefits EBS licensees are receiving could be provided through alternative subsidy mechanisms. For example, in exchange for commercial use of its spectrum, a school board whose FCC license would be worth up to \$157 million at auction is currently receiving an educational use benefit that amounts to \$0.02 per K-12 student per month that can only be used to buy retail wireless broadband services from Sprint.

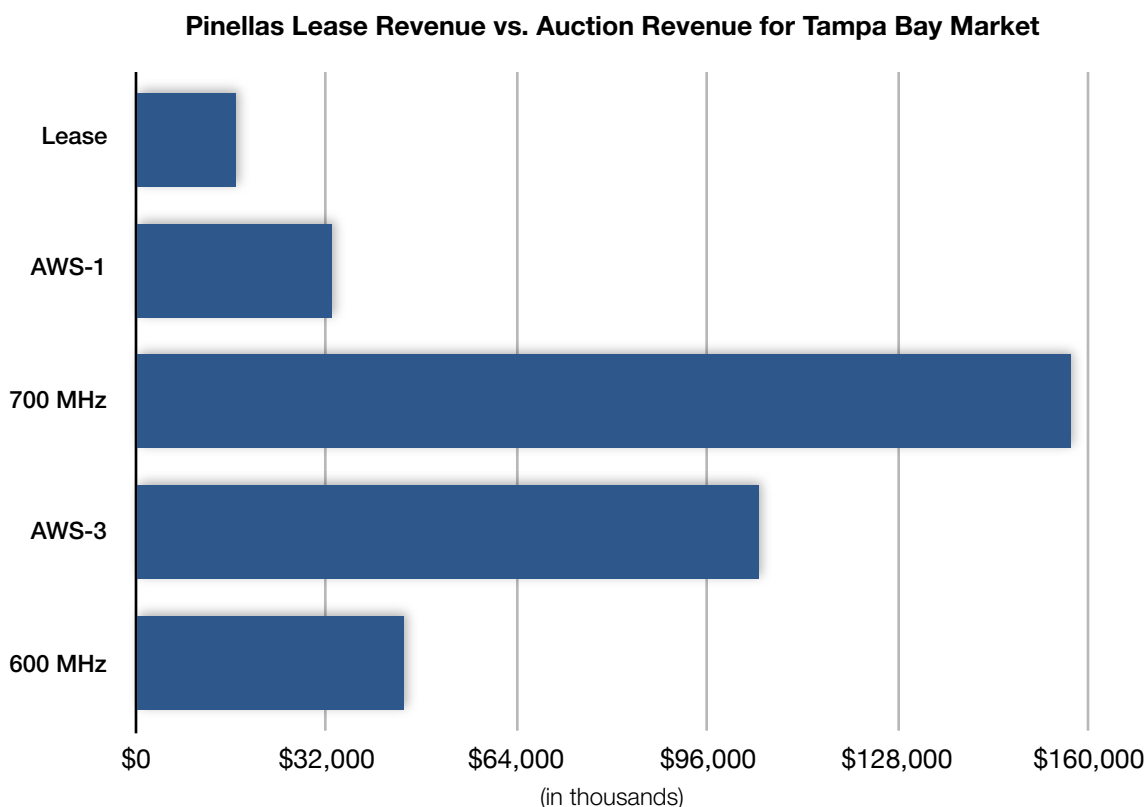
The EBS leasing scheme is not needs-based. More than 20 post-secondary educational institutions that hold EBS licenses have an endowment that is worth more than \$1 billion—e.g., Emory University, whose \$7.292 billion endowment equates to \$515,165 per student. The vast majority of these elite institutions are leasing their spectrum rights to commercial operators to pad their budgets while K-12 students in rural and underserved areas struggle against the homework gap.

¹ See Ronald H. Coase, *The Federal Communications Commission*, *Journal of Law and Economics*, Vol. 2 at p. 18 (Oct., 1959).

² The FCC Report to Congress on Spectrum Auctions, FCC 97-353 at pp. 9-10 (Oct. 9, 1997).

- **An incentive auction would yield higher revenue for incumbent EBS licensees and higher-quality educational broadband services for all K-12 educational institutions.**

Pricing data from previous FCC auctions indicates that EBS licensees' spectrum rights would be worth from 1.8 to 14.5 times more, on average, if the spectrum was sold on a commercial basis through a voluntary incentive auction. For example, EBS spectrum the School Board for Pinellas County, Florida is leasing for a total of \$16,725,656 over a thirty-year period would be worth from \$32,939,861 to \$157,059,121 at auction (2 to 9.3 times more than the total lease payments).



- **History, economic theory, and empirical evidence demonstrate that incentive auctions are more efficient than secondary market transactions.**

The secondary market for mobile spectrum licenses exhibits significant transactions costs, including bargaining problems (e.g., holdouts) and uncertainty about the final cost of assembling a broad spectrum footprint through piecemeal negotiations with multiple licensees. Congress granted auction authority to the FCC in 1992 as a remedy for these inefficiencies, and the greater efficiency of auctions was the basis for transitioning broadcast licenses to mobile use through the very first incentive auction in 2016. The FCC should not turn its back on auctions now. Granting new EBS licenses using filing windows and new flexible-use rights through fiat would promote the same economic inefficiencies that have plagued earlier efforts to assign spectrum rights without a competitive bidding process while relying on secondary market transactions to correct the resulting deficiencies in the initial distribution of spectrum rights.

This paper also proposes measures that are intended to maximize the voluntary participation of EBS licensees in an incentive auction while honoring existing spectrum leases. To accomplish this, the FCC should clarify that (1) it has legal authority to adopt spectrum licensing policies that impact the terms and conditions of existing spectrum leases, (2) any lease terms or conditions that could prevent EBS licensees from participating in an incentive auction are inconsistent with the FCC’s spectrum licensing and secondary markets policies, and (3) EBS licenses for spectrum that is sold in the incentive auction cannot be renewed. With these appropriate and limited clarifications, honoring existing spectrum leases would not prevent the FCC from holding a successful EBS incentive auction.

In addition to these measures, the paper suggests that the FCC (1) adopt county-sized geographic license areas for new EBS licenses, (2) consider reconfiguring EBS licensees’ circular geographic service areas based on the weighted MHz-pops methodology it recently adopted for the 39 GHz band, and (3) consider conditioning the T-Mobile-Sprint merger on the voluntarily termination of the new company’s lease rights with respect to the sale of EBS licenses to third-parties.

A voluntary incentive auction is the FCC’s best option for maximizing efficient and effective use of EBS spectrum and would have the added benefit of eliminating a duplicative and inefficient subsidy program for educational broadband. If the FCC were to instead adopt the filing-window approach, it would support past skepticism of the agency as an “economics-free zone” and deal a body-blow to the credibility of the agency’s new Office of Economics and Analytics.

II. History of the 2.5 GHz Spectrum Band

A. Instructional Television Fixed Service

Fifty years ago the FCC allocated 31 television channels (of 6 MHz each) from 2500 to 2690 MHz to the Instructional Television Fixed Service (ITFS) for the transmission of educational programming using the analog television broadcast standard.³ The ITFS channels were allocated on a shared basis with the preexisting Operational Fixed Service (OFS) and International Control stations.⁴

³ See Amendments of Parts 2 and 4 of the Commission’s Rules and Regulations to Establish a New Class of Educational Television Service for the Transmission of Instructional and Cultural Material to Multiple Receiving Locations on Channels in the 1990-2110 Mc/s or 2500-2690 Mc/s Frequency Band, Report and Order, 39 FCC 846, ¶¶ 15, 39, App. §§ 4.902(a), 4.938 (Jul. 25, 1963) (ITFS Allocation Order). The FCC chose the 2.5 GHz band over the 1990 to 2110 MHz band because (1) the “propagation characteristics are essentially the same in either band,” (2) ITFS could be implemented with the least disruption to existing services in the 2.5 GHz band, and (3) the wider bandwidth available in the 2.5 GHz band could accommodate more channels. See *id.* at ¶¶ 15.

⁴ See *id.* at ¶ 16, App. § 4.902(b).

When the FCC reevaluated the 2.5 GHz band in the early 1970s, it allocated 28 channels exclusively to the ITFS, 3 channels exclusively to the OFS, and deleted the allocation for International Control stations.⁵

The FCC reconsidered the ITFS allocation again in the early 1980s.⁶ The FCC noted that, although most ITFS channels had been licensed in the largest metropolitan areas (e.g., New York, Los Angeles, and Chicago), in many metropolitan and most rural areas there had been little or no ITFS use in the previous twenty years.⁷ In contrast, there was growing demand for spectrum in the Multipoint Distribution Service (MDS), a wireless cable service operating on 2 channels in the 2.1 GHz band that was considered a potential competitor to wired cable systems.⁸ To accommodate this demand, the FCC reallocated 8 ITFS channels to the commercial MDS.⁹

In the 1990s, the FCC reallocated the three Operational Fixed Service channels to MDS¹⁰ and authorized both ITFS and MDS licensees to offer digital,¹¹ “two-way” services¹² in the 2.5 GHz band, including Internet access.¹³ Despite these FCC efforts to modernize its rules governing MDS and allocate additional

⁵ See Amendment of Parts 2 and 74 of the Commission’s Rules and Regulations to Establish a New Class of Educational Television Service for the Transmission of Instructional and Cultural Material to Multiple Receiving Locations on Channels in the 2500-2690 MHz Frequency Band, Second Report and Order, FCC 71-600, 30 FCC 2d 197, ¶¶ 12-13 (Jun. 14, 1971).

⁶ See Amendment of Parts 2, 21, 74 and 94 of the Commission’s Rules and Regulations in regard to frequency allocation to the Instructional Television Fixed Service, the Multipoint Distribution Service, and the Private Operational Fixed Microwave Service, Report and Order, FCC 83-243, 94 FCC 2d 1203 (Jul. 15, 1983) (ITFS Reallocation Order).

⁷ See *id.* at ¶¶ 19, 54.

⁸ See Amendment of Parts 21 and 74 of the Commission’s Rules with Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, Report and Order, 10 FCC Rcd. 9589, ¶ 6 (Jun. 30, 1995).

⁹ See ITFS Reallocation Order at ¶ 4. Note that, although MDS channels in the 2.5 GHz band were designated as Multichannel Multipoint Distribution Service (MMDS) channels (because they enabled the use of multiple MDS channels on a nationwide basis for the first time), this paper refers to both MDS and MMDS channels as MDS channels. At this point, the 2.5 GHz band was comprised of 20 ITFS channels, 8 MDS channels, and 3 OFS channels.

¹⁰ See Amendment of Parts 21, 43, 74, 78, and 94 of the Commission’s Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multichannel Multipoint Distribution Service, Instructional Television Fixed Service, and Cable Television Relay Service, Second Report and Order, FCC 91-302, 6 FCC Rcd. 6792 (Oct. 25, 1991). As a result, MDS was allocated 11 channels in total.

¹¹ See Request for Declaratory Ruling on the Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations, Declaratory Ruling and Order, FCC 96-304, 11 FCC Rcd. 18839 (Jul. 10, 1996) (authorizing 2.5 GHz licensees to employ digital technologies).

¹² See Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Fixed Television Service Licensees to Engage in Fixed Two-Way Transmissions, Report and Order, FCC 98-231, 13 FCC Rcd. 19112 (Sep. 25, 1998).

¹³ See The Mass Media Bureau Implements Policy for Provision of Internet Service on MMDS and Leased ITFS Frequencies, Public Notice, DA 96-1720, 11 FCC Rcd. 22419 (1996) (authorizing high-speed digital data applications in the band, including Internet access).

educational spectrum for commercial use, most wireless cable and two-way systems were not commercially successful.

At the 2000 World Radiocommunication Conference, the United States identified the 2.5 GHz band for third generation (3G) mobile services (known internationally as IMT-2000).¹⁴ FCC staff subsequently conducted an analysis of the 2.5 GHz band and concluded that (1) there was no readily identifiable alternate frequency band that could accommodate incumbent ITFS and MDS licensees, and (2) sharing between incumbents and 3G mobile services would not be practical.¹⁵ Based on this analysis, the FCC declined to reallocate the 2.5 GHz band for 3G services through competitive bidding in 2001.¹⁶ The FCC instead opted to allow incumbent MDS licensees to transition their systems to advanced wireless services gradually through secondary markets transactions.¹⁷ The FCC added an allocation for mobile services to the 2.5 GHz band and “committed to exploring service rules to permit mobile operations” in a future proceeding.¹⁸

The FCC initiated the promised service rules proceeding in 2003¹⁹ and adopted mobile service rules for the 2.5 GHz band a year later.²⁰ The new rules enabled 2.5 GHz licensees to transition the band from a television-centric, interleaved band plan with traditional site-based licensing to a mobile-centric,

¹⁴ See Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, Notice of Proposed Rule Making, FCC 00-455, 16 FCC Rcd. 596, ¶ 4, n.10 (2001).

¹⁵ See FCC, Spectrum Study of the 2500-2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems, Final Report, ET Docket No. 00-258 at i-iii (Mar. 30, 2001), available at <http://transition.fcc.gov/3G/3gfinalreport.pdf>.

¹⁶ See Amendment of the U.S. Table of Frequency Allocations to Designate the 2500-2520/2670-2690 MHz Frequency Bands for the Mobile-Satellite Service, First Report and Order and Memorandum Opinion and Order, FCC 01-256, 16 FCC Rcd. 17222, ¶¶ 19-20 (2001) (Mobile Allocation Order). The FCC subsequently allocated frequencies for advanced wireless services in the 1.7 and 2.1 GHz bands. See Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, Second Report and Order, FCC 02-304, 17 FCC Rcd. 23193, ¶ 1 (Nov. 7, 2002).

¹⁷ See Mobile Allocation Order at ¶ 2.

¹⁸ See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, Notice of Proposed Rulemaking and Memorandum Opinion and Order, FCC 03-56, 18 FCC Rcd. 6722, ¶ 15 (Apr. 2, 2003) (BRS/EBS NPRM).

¹⁹ See *id.*

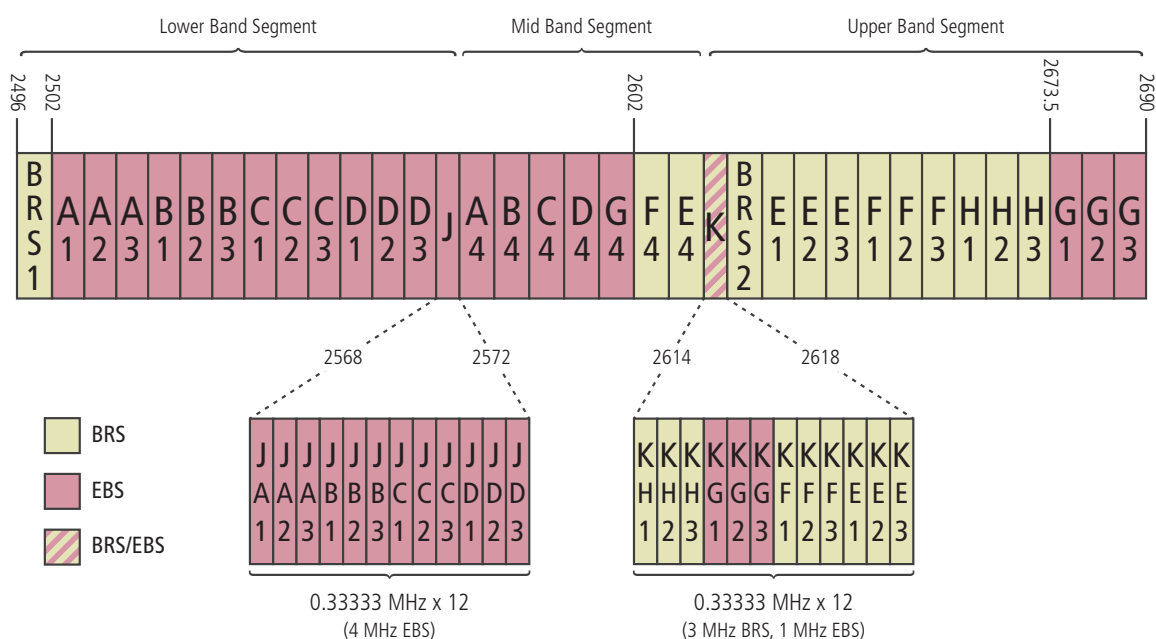
²⁰ See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, Report and Order and Further Notice of Proposed Rulemaking, FCC 04-135, 19 FCC Rcd. 14165 (2004) (First BRS/EBS Order). See also Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, Order on Reconsideration and Fifth Memorandum Opinion and Order and Third Memorandum Opinion and Order and Second Report and Order, FCC 06-46, 21 FCC Rcd. 5606 (2006) (reconsidering certain rules adopted in the First BRS/EBS Order) (Second BRS/EBS Order).

contiguous band plan with geographic area licensing.²¹ The new service rules converted MDS to the commercial Broadband Radio Service (BRS) and ITFS to the non-profit Educational Broadband Service.

The resulting band plan is comprised of 194 MHz of spectrum (from 2496 to 2690 MHz²²), of which 117.5 MHz is allocated primarily for EBS and 76.5 MHz is allocated for BRS. This band plan is divided into three segments:

- The lower band segment, extending from 2496-2572 MHz, and comprised of twelve 5.5-megahertz-wide channels, one 6-megahertz-wide channel (BRS 1), and one 4-megahertz-wide guard band;
- The mid-band segment, extending from 2572-2614 MHz, and comprised of seven 6-megahertz wide channels; and
- The upper band segment, extending from 2614-2690 MHz, and comprised of twelve 5.5-megahertz wide channels, one 6-megahertz-wide channel (BRS 2), and one 4-megahertz-wide guard band.²³

Only the mid-band segment is eligible for high power broadcast operations — the upper and lower band segments are limited to low power operations only.²⁴



B. Educational Eligibility and Use Requirements

When the ITFS was established in 1963, its primary purpose was to transmit educational television programming directly to accredited schools and colleges for the formal education of students.²⁵ To ensure licenses were used primarily for educational purposes, the FCC limited eligibility to hold an ITFS license to accredited educational institutions, governmental organizations engaged in the formal education of students, and non-profit organizations that provide educational services to these educational entities.²⁶

When the FCC allocated a portion of the 2.5 GHz spectrum for commercial MDS in the early 1980s, it authorized ITFS licensees to lease “excess” capacity to wireless cable operators for non-educational purposes on a for-profit basis.²⁷ The FCC permitted leasing in order to generate revenue for additional educational programming and ITFS stations (which had been adversely impacted by declines in federal funding).²⁸ The FCC did not initially adopt any limitations on the non-educational use of ITFS spectrum or require that revenue generated through leasing be used for ITFS.²⁹

After the FCC authorized for-profit leasing of educational spectrum, the agency noticed a significant increase in the number of applications for new ITFS stations, primarily by non-local, nonprofit organizations.³⁰ The FCC concluded that this increased interest in ITFS spectrum “was clearly a result of the decision to permit the use of ITFS excess channel capacity for commercial purposes,” because most new ITFS applications proposed to lease capacity to commercial MDS operators. “It was not anticipated that a few MDS operators would funnel most of their financial resources primarily into a small number of nonlocal entities that, in turn, have applied for hundreds of channels nationwide.”³¹

The FCC responded to this unintended consequence by modifying the ITFS rules to prioritize the grant of spectrum to local applicants and require a minimum “substantial use” of 20 hours per week per channel for educational programming before an ITFS channel could be used for non-educational purposes.³²

²⁵ See ITFS Allocation Order at ¶ 25, App. § 4.931. ITFS stations could also be used for incidental transmissions (e.g., training and administrative purposes). See *id.*

²⁶ See *id.* at ¶ 27. See also BRS/EBS NPRM at ¶ 107.

²⁷ See ITFS Reallocation Order at ¶¶ 114-18.

²⁸ See *id.* at ¶¶ 114-18.

²⁹ See *id.* at ¶ 118.

³⁰ See Amendment of Part 74 of the Commission's Rules and Regulations in Regard to the Instructional Television Fixed Service, Second Report and Order, FCC 85-294, 101 FCC 2d 49, ¶ 3 (Jun. 20, 1985) (ITFS Educational Use Order). See also First BRS/EBS Order at ¶ 14.

³¹ ITFS Educational Use Order at ¶ 17.

³² See *id.* at ¶¶ 90-97.

The FCC subsequently declared that this “substantial use” requirement applied only once to each assigned 6 MHz ITFS channel even if the licensee used digital compression technologies capable of providing multiple programming streams within its assigned 6 MHz of bandwidth.³³

In the early 1990s, the FCC determined that ITFS licensees could meet their educational usage requirement using a single 6 MHz channel, e.g., an ITFS licensee could move all of its ITFS programming to one of its channels and lease the remaining channels on a twenty-four-hour basis to a wireless cable operator.³⁴

As a result of these decisions, by the mid-1990s, ITFS operators were authorized to lease up to 95 percent of their spectrum capacity for commercial use.³⁵

When the FCC reconfigured the 2.5 GHz band for broadband services, it recognized that it had “progressively relaxed the educational content obligations of ITFS licensees” so that ITFS licensees could “lease all but a small fraction of their capacity to commercial operators” to generate income.³⁶ The FCC also acknowledged that overall utilization of the ITFS spectrum was relatively low, and that few ITFS licensees used the band intensively for educational purposes.³⁷ The FCC nevertheless decided to retain the ITFS licensing regime’s eligibility and educational use restrictions for the new Educational Broadband Service in order to support the remaining educational services in the 2.5 GHz band.³⁸ The FCC remained optimistic that its revised rules would encourage EBS licensees to use their spectrum more efficiently and noted its intent to monitor their progress.³⁹

C. EBS White Spaces

When the FCC last revised the 2.5 GHz band plan, it did not adopt a mechanism to license additional spectrum in the band. The FCC placed a freeze on the filing of new applications for educational spectrum⁴⁰ and sought public comment on how it should issue commercial BRS and EBS licenses going

³³ See General Electric Co., Memorandum Opinion and Order, 61 Rad. Reg. 2d 143, ¶¶ 15-16 (Mass Media Bur., Sep. 22, 1986).

³⁴ See Amendment of Part 74 of the Commission’s Rules Governing Use of the Frequencies in the Instructional Television Fixed Service, Report and Order, FCC 94-147, 9 FCC Rcd. 3360 (Jul. 6, 1994).

³⁵ See First BRS/EBS Order at ¶ 12.

³⁶ See *id.* at ¶ 150.

³⁷ See *id.* at ¶ 156.

³⁸ See *id.* at ¶ 152.

³⁹ See *id.* at ¶ 156.

⁴⁰ The FCC placed a freeze on certain ITFS applications when it opened the rebanding proceeding, see BRS/EBS NPRM at ¶¶ 226-29, and extended the freeze in the First BRS/EBS Order at ¶ 263.

forward.⁴¹ The FCC decided how to license BRS spectrum in 2008, but has not yet lifted the freeze on EBS licensing.⁴²

The FCC recently opened a new rulemaking proceeding to consider how it will assign the EBS white spaces (spectrum that is not currently licensed) and other measures to promote more efficient and effective use of the EBS spectrum band.⁴³

III. EBS Incentive Auction Proposal

A. The FCC should hold a voluntary incentive auction that offers licenses for the EBS white spaces together with incumbent EBS licenses.

Comparing the results of the AWS-1 and 700 MHz auctions with the lengthy history of the EBS spectrum band, particularly the FCC's decision to forgo an auction of the 2.5 GHz band for 3G, leaves little doubt regarding the better course in this proceeding.

The FCC auctioned the AWS-1 band (2006) the same year it completed reconfiguring the 2.5 GHz band for broadband services (2006), and not long thereafter it auctioned the remainder of the 700 MHz band for 4G services (2008). The AWS-1 and 700 MHz spectrum generated substantial auction revenue and prompted rapid network deployment that enabled the U.S. to lead the world in 4G, and in the meantime, the 2.5 GHz band languished. While deployment in the 2.5 GHz band has seen an uptick recently, progress in the band overall has been glacial relative to its peers.

The lesson is clear: FCC auctions are better at getting spectrum into the hands of those who value it the most than secondary market transactions. The FCC should not make the same mistake it made in the run-up to 3G and continue to rely on leasing to promote efficient and effective use of EBS spectrum. It should instead adopt policies that encourage EBS licensees to participate in a voluntary incentive auction that will help pave the way for a successful transition to 5G.

⁴¹ See First BRS/EBS Order at ¶¶ 263.

⁴² See Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, Third Order on Reconsideration, FCC 08-83, 23 FCC Rcd. 5992, ¶¶ 11-20 (Mar. 20, 2008) (BRS Reconsideration Order).

⁴³ See Transforming the 2.5 GHz Band, Notice of Proposed Rulemaking, FCC 18-59 (May 10, 2018) (EBS NPRM), <https://www.fcc.gov/edocs/search-results?t=advanced&fccNo=18-59>.

B. An incentive auction would maximize the educational value of EBS spectrum by converting the leasing scheme's implicit and inefficient subsidy into an explicit needs-based subsidy for educational broadband.

The FCC initially permitted EBS licensees to lease their spectrum for commercial use as a means of implicitly subsidizing educational television programming (a positive externality) and later extended this implicit subsidy to educational broadband service. Though the FCC's intent was laudable, the implicit subsidy in the EBS licensing system is economically inefficient, largely duplicative of the agency's E-rate program for subsidizing educational broadband connections, and conducive to waste, fraud, and abuse. An incentive auction would maximize the educational value of EBS spectrum by converting the current system's implicit, inefficient subsidy into an explicit needs-based subsidy.

When evaluating the efficiency of an implicit subsidy, the primary questions are (1) whether the subsidy's potential benefits (e.g., promoting educational broadband service) outweigh its costs (e.g., less efficient allocation of spectrum resources), and (2) whether an alternative approach would be more efficient (e.g., whether an EBS incentive auction would promote higher-quality educational broadband services at lower cost). The second question is dispositive in this case.

1. The Costs of EBS Leasing Are Higher than an Incentive Auction

As discussed in Section III.D below, history, economic theory and empirical evidence all show that spectrum auctions assign mobile spectrum rights more efficiently than secondary market transactions. While this is true generally, the additional costs that inhere in the secondary market for commercial mobile spectrum licenses are likely to be even greater in the context of EBS leasing, where one side of the secondary market consists of governmental and non-profit institutions that are partly insulated from market forces by their very nature.

In addition to having lower incentives, EBS licensees will typically have less ability to maximize the value of their spectrum resources than commercial mobile service providers. EBS licensees' primary expertise is education, not mobile communications. Even the most sophisticated EBS licensees are likely to have less expertise in managing valuable spectrum resources—e.g., placing an appropriate value on their spectrum lease rights—than the largest mobile providers. For most local school boards and their administrators, the gap in expertise is likely to be a chasm.

2. The Benefits of EBS Leasing Are Lower than an Incentive Auction

The contrast in choices—between EBS leasing and an incentive auction—is even starker on the benefits side of the ledger.

This is largely due to the EBS leasing scheme's lack of transparency, which leaves the FCC without sufficient quantitative or qualitative data to perform a reasonable cost-benefit analysis. EBS licensees are not required to submit their leases to the FCC or file reports regarding the quantity or quality of their

educational usage.⁴⁴ Though EBS licensees are required to make their leases available for inspection by the FCC upon its request, it does not appear that the FCC has ever audited EBS leases.

Though some EBS licensees have submitted data regarding the implicit subsidy's benefits,⁴⁵ the submitted data does not address many of the key questions a reasonable cost-benefit analysis must answer. For example, data regarding the sheer number of schools an EBS licensee serves has little meaning without data regarding the number of students who are actually receiving EBS service at those schools, the quality of service they are receiving and, most importantly, whether the same benefits could be delivered more efficiently through an explicit subsidy that does not rely on educational institutions to manage valuable FCC spectrum licenses effectively.

This issue is exemplified by the only publicly available EBS lease (to the author's knowledge), which was entered into between the School Board of Pinellas County, Florida and Clearwire (now Sprint) in 2010.⁴⁶ Though the lease appears to permit the School Board to build its own wireless network on 5% of the licensed spectrum's capacity,⁴⁷ technology standards, the laws of physics (e.g., the need to avoid adjacent channel interference), and the "Use of Capacity" provision in the lease make that option a practical impossibility.⁴⁸ The only practical option for meeting the educational use requirement is a lease provision that provides the School Board with a service credit against Sprint's lease payments that the School Board can use to buy retail wireless broadband services from Sprint, at least to the extent that the school's end users are located in Sprint's retail service area.⁴⁹ The monthly service credit starts at \$1,000 in the first year of the lease and increases by 3% per year thereafter.

The primary problem with this subsidy approach is that the School Board does not need to manage an FCC spectrum license to obtain the benefit: the School Board could buy the same retail services without holding an EBS license, either by using its own budgetary resources or through equivalent funding provided by an explicit subsidy program.

The \$1,000 monthly service credit is also laughably inadequate for Pinellas County Schools' broadband service needs. According to its website, the Pinellas County School Board has jurisdiction over 140 K-12

⁴⁴ See Second BRS/EBS Order at ¶¶ 251-53.

⁴⁵ See Voqal and North American Catholic Educational Programming Foundation, Inc., Notice of Ex Parte, WTB Docket No. 18-120 (filed May 3, 2018), <https://www.fcc.gov/ecfs/filing/105030964425947>.

⁴⁶ See Educational Broadband Service Long-Term De Facto Lease Agreement at § 5(c) (dated May 25, 2010) (Pinellas County Lease), available at <http://pinellasschool.iqm2.com/Citizens/SplitView.aspx?Mode=Video&MeetingID=1074&MinutesItemID=6911&MinutesID=1074&FileFormat=doc&Format=Minutes&MediaFileFormat=wmv>.

⁴⁷ See Pinellas County Lease at sec. 5(b) (defining "Licensee's Reserved Capacity" as equivalent to the FCC's 5% capacity requirement).

⁴⁸ See *id.* at § 5(c).

⁴⁹ See *id.* at §§ 5(c), 7.

schools that have more than 97,793 students.⁵⁰ It has 12,517 full-time employees and a budget of \$1.5 billion (\$1,518,950,454).⁵¹ Thus, while the monthly credit could be described statistically as providing broadband service to 140 K-12 schools (e.g., by using the credit to provide mobile service to county-wide administrators)—an impressive statistic in the abstract—the actual benefit of \$1,266.77 per month in year nine of the lease (presumably covering 2019) amounts to \$16.19 per K-12 school or \$0.02 per K-12 student per month.

If the entire amount of the monthly lease payment were considered to be part of the educational broadband service benefit to the Pinellas County School Board, these numbers rise to \$265.09 per K-12 school or \$0.38 per K-12 student per month. These higher amounts are still inadequate to meet Pinellas County School's high-speed broadband needs at Sprint's ordinary retail prices. But, even if they were, there is no evidence indicating that EBS licensees use their "excess capacity" lease payments solely to provide educational broadband services. There is no requirement in the FCC's rules that EBS lease payments be used exclusively for broadband service: EBS licensees are free to use this money for a new swimming pool or anything else that might fall within the legitimate purview of their budgets. While these expenditures might benefit education generally, they are outside the ambit of the FCC's statutory purpose of ensuring the availability of efficient communications services.⁵²

3. The EBS Leasing Subsidy Is Not Needs-Based

The precursor to EBS—the Instructional Television Fixed Service—was needs-based in broad terms. When ITFS was created, educational television could not be delivered to most schools without allocating broadcast frequencies for that purpose. It was also neutral with respect to jurisdictional boundaries, both geographically and between different administrations within the same area (e.g., K-12 versus post-secondary educational institutions), because educational programming that was transmitted using the analog television standard could be received by any institution covered by the broadcast signal.

In the broadband era, however, there is no longer any relationship between the implicit subsidy in the EBS licensing scheme and the needs of particular educational institutions within a given area. An EBS license that is being used to provide broadband services to a post-secondary school typically will not benefit K-12 schools and other educational institutions in the same area, and vice-versa, irrespective of need.

⁵⁰ See Pinellas County Schools webpage, Facts-at-a-Glance, <https://www.pcsb.org/Page/650>. The data used in this paper focuses on the County's statistics regarding K-12 education and, to the extent possible, excludes its statistics regarding the Pinellas Virtual School, Pinellas Technical College, Adult General Education, and schools described as pre-K and "other."

⁵¹ See *id.*

⁵² See 47 U.S.C. § 151.

For example, there are more than 20 post-secondary educational institutions whose endowments are worth more than \$1 billion each, as of 2018,⁵³ that also hold EBS licenses:

- Emory University: \$7.292 billion (\$515,165 per student)
- University of California Regents: \$11.008 billion (not including the separate endowments of certain institutions such as UCLA, UC Berkley, or UC San Francisco)
- Texas A&M: \$13.525 billion
- Purdue: \$2.524 billion
- Indiana University: \$2.397 billion
- Ohio State University: \$5.211 billion
- University of North Carolina at Chapel Hill: \$3.433 billion
- University of Utah: \$1.187 billion
- University of Wisconsin: \$2.985 billion
- University of Minnesota: \$3.717 billion
- University of Cincinnati: \$1.367 billion
- University of Iowa: \$1.500 billion
- University of Maryland: \$1.298 billion
- University of Georgia: \$1.274 billion
- Rutgers: \$1.330 billion
- Georgia Institute of Technology: \$2.091 billion
- University of Colorado: \$1.361 billion
- University of Nebraska: \$1.723 billion
- Tulane: \$1.384 billion
- University of Alabama: \$1.452 billion
- Virginia Tech: \$1.146 billion

Despite their already impressive endowments, the FCC's universal licensing system indicates that most of these universities lease their EBS spectrum rights to commercial operators to generate even more revenue.

It does not serve the FCC's mission or the public interest to subsidize the general operations of these elite institutions and other well-funded school systems at the expense of closing the homework gap for K-12 students in rural and underserved communities.

⁵³ See 2018 NACUBO-TIAA Study of Endowments, All U.S. and Canadian NTSE Participating Institutions Listed by Fiscal Year 2018 Endowment Market Value, and Percentage Change in Market Value from FY17 to FY18, <https://www.nacubo.org/Research/2019/Public-NTSE-Tables>.

C. An incentive auction would yield higher revenue for incumbent EBS licensees and higher-quality educational broadband services for all educational institutions.

Even assuming the FCC deems the continued subsidy of EBS licensees to be appropriate, empirical evidence indicates that EBS licensees' spectrum rights provide substantially less revenue when leased rather than auctioned. Though there is little publicly-available data regarding EBS lease values, Sprint submitted expert testimony to the FCC in 2013 that placed the value of leased EBS spectrum at \$0.05 to \$0.14 per MHz-pop.⁵⁴ In the absence of actual data regarding the terms and conditions of EBS leases, it is reasonable to assume that Sprint used similarly discounted spectrum valuations as its baseline when negotiating EBS lease terms.

Assuming the high-end of Sprint's 2013 valuation of \$0.14 per MHz-pop reflects the average MHz-pop price Sprint is actually paying EBS licensees, the value of leased EBS spectrum would still be substantially lower than the average MHz-pop prices that have been paid for mobile spectrum in FCC auctions. The net average MHz-pops price for spectrum sold in the AWS-1, 700 MHz, AWS-3, and 600 MHz auctions indicates that, on average, if EBS spectrum were sold with flexible-use rights through an incentive auction it would be worth from 3.8 to 14.5 times more than the Sprint expert's high-end valuation.

Sprint Expert's High-End EBS Lease Value vs. Auction Value

AUCTION	BAND	BLOCKS	AUCTION MHZ-POP	EBS LEASE MHZ-POP	PERCENT INCREASE	AUCTION MULTIPLE
66	AWS-1	A-F	\$0.53	\$0.14	279%	3.8
73	700	A-B, E, C	\$1.28	\$0.14	814%	9.1
97	AWS-3	A1-B1, G-J	\$2.03	\$0.14	1350%	14.5
1002	600	A-G	\$0.77	\$0.14	450%	5.5

Sprint's acquisition of Clearwire in 2013 provides another potential source for EBS lease prices. Sprint paid approximately \$0.30 per MHz-pop to acquire Clearwire's EBS leases after winning a bidding war with DISH Network.⁵⁵ This transaction price is likely to be higher than the average MHz-pop price most EBS licensees are currently receiving via their leases, because most EBS leases predate the transaction. Even assuming the transaction price accurately reflects the average EBS lease rate, auction pricing data indicates that EBS spectrum auctioned with flexible-use rights would be worth from 1.8 to 6.8 times more than the \$0.30 per MHz-pop that Sprint paid Clearwire for its EBS leases.

⁵⁴ See Dr. Kostas Liopiros, Value and Utility of the U.S. 2.5 GHz Spectrum Band, Prepared for Sprint Nextel (Feb. 27, 2013). Auctioning EBS spectrum with flexible use rights for 5G services would negate the expert's reasons for discounting the value of EBS spectrum in comparison to other mobile bands.

⁵⁵ See News Release, Sprint, Sprint and Clearwire Agree to Increased Acquisition Offer (Jun. 20, 2013), <http://newsroom.sprint.com/news-releases/sprint-and-clearwire-agree-to-increased-acquisition-offer.htm>. This amount appears to assign zero value to Clearwire's other assets.

Clearwire Transaction's EBS Lease Value vs. Auction Value

AUCTION	BAND	BLOCKS	AUCTION MHZ-POP	EBS LEASE MHZ-POP	PERCENT INCREASE	AUCTION MULTIPLE
66	AWS-1	A-F	\$0.53	\$0.30	77%	1.8
73	700	A-B, E, C	\$1.28	\$0.30	327%	4.3
97	AWS-3	A1-B1, G-J	\$2.03	\$0.30	577%	6.8
1002	600	A-G	\$0.77	\$0.30	157%	2.6

The auction datas' average MHz-pop prices would likely skew higher for incumbent EBS spectrum in an EBS incentive auction, because the auction data used in these examples include licenses in rural areas where spectrum is worth significantly less, on average, than the primarily urban areas where incumbent EBS licenses tend to be concentrated.

The MHz-pop value Sprint is paying for EBS spectrum under the Pinellas County Lease corroborates the pricing analysis above. The leased spectrum is comprised of four EBS channels (A1, A4, D1 and D4) in the Tampa Bay area, the 19th largest cellular market.⁵⁶

The payment schedule in the Pinellas County Lease provides for (1) monthly payments to the EBS licensee over the thirty-year lease period and (2) monthly credit amounts that the EBS licensee can apply toward purchasing "standard retail [wireless broadband] service offerings" from the lessee (Sprint) to the extent the lessee offers service in the license area. The monthly payments and credits start with base amounts for year one (\$29,296.74 and \$1,000.00 per month, respectively) that increase by three-percent every year. Over the thirty-year period of the lease, the potential service credits total \$570,904.92. The lease payments total \$16,725,655.08 if no credits are used, with a net total of \$16,154,750.16 if all credits are used.

Based on the gross lease payments (\$16,725,655.08) and the population covered by the licenses as stated in the lease,⁵⁷ the EBS spectrum in the Pinellas County Lease is valued at a MHz-pops price of \$0.35 over the entire 30-year period of the lease—substantially less than the net MHz-pops price paid for the Tampa Bay market in the AWS-1, 700 MHz, AWS-3, and 600 MHz auctions. In those auctions, licenses for the Tampa Bay CMA (covering Hillsborough, Pasco, and Pinellas Counties) and EA/PEA (covering Hernando, Hillsborough, Pasco, and Pinellas Counties) sold for 2 to 9.3 times more than the \$0.35 MHz-pop price in the Pinellas County Lease.⁵⁸

⁵⁶ This ranking is based on the population assigned to CMA022, Tampa Bay-St. Petersburg, in the FCC's AWS-3 and 600 MHz auctions.

⁵⁷ The lease estimates the population covered by the D channels, Call Sign WLX226, to be 1,929,062 based on 2005 U.S. Census Data estimates. Channel A1 covers an estimated population of 2,044,023, and Channel A4 covers an estimated population of 2,212,080. See Pinellas County Lease at Ex. 1.

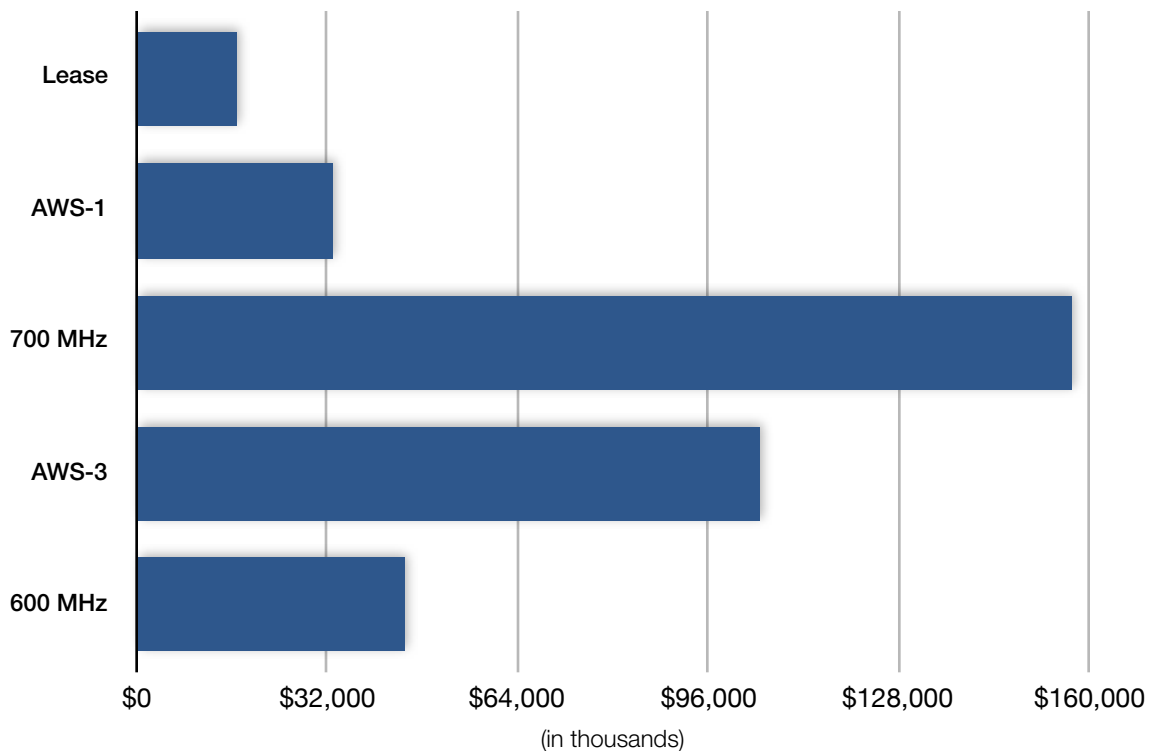
⁵⁸ Note that these MHz-pop calculations were based on the population the FCC assigned to each license at the time of the auction. The FCC's population counts were not adjusted to match the 2005 U.S. Census Data estimates used in the Pinellas County Lease because the auction price data reflects the population at the time the licenses were sold.

Pinellas Lease Value vs. Auction Value for Tampa Bay Market

AUCTION	BAND	BLOCKS	AUCTION MHZ-POP	EBS LEASE MHZ-POP	PERCENT INCREASE	AUCTION MULTIPLE
66	AWS-1	A-B, C	\$0.69	\$0.35	97%	2.0
73	700	A-B, E	\$3.27	\$0.35	834%	9.3
97	AWS-3	A1-B1, G-J	\$2.17	\$0.35	520%	6.2
1002	600	A-G	\$0.94	\$0.35	169%	2.7

For the Pinellas County School Board's EBS spectrum, this equates to a net auction value ranging from \$32,939,861 to \$157,059,121 (compared to the \$16,725,656 in gross payments the licensee is entitled to receive over the 30-year period of the lease).⁵⁹

Pinellas Lease Revenue vs. Auction Revenue for Tampa Bay Market



The additional revenue generated by an incentive auction would ensure that incumbent EBS licensees would not be adversely affected by a loss of leasing revenue.

⁵⁹ These figures were calculated by multiplying the MHz-pop price for the auctioned licenses by the population counts for the EBS channels that are provided in the lease. The population counts used to derive the MHz-pop prices for the auction do not match the population counts for the EBS channels precisely, because the EBS channels' coverage is not coextensive with the relevant county boundaries. When comparing prices on a MHz-pops basis, which inherently adjusts for population different population counts, the differences appear to be *de minimis* based on the relative population density of the Tampa Bay Area during the relevant period.

Widespread participation in an incentive auction by incumbent licensees would also make licenses for the EBS white spaces more valuable by providing bidders with the ability to acquire a substantial spectrum footprint in the band. If additional funding from the incentive auction were targeted toward closing the homework gap through a needs-based funding program, an incentive auction would also improve broadband access for all educational institutions.

D. History, economic theory, and empirical evidence demonstrate that incentive auctions are more efficient than secondary market transactions.

The FCC should not grant commercial spectrum rights to EBS licensees without a competitive bidding process. The current distribution of EBS licenses and leases is the historical legacy of the band's educational eligibility and use requirements. This legacy does not reflect the spectrum's potential to be a keystone in the deployment of next-generation 5G networks, and it is unreasonable to assume that the current lessees of restricted EBS spectrum value it more highly than other parties who would be interested in that spectrum if it were offered on an unrestricted basis in a simultaneous auction. Eliminating the educational restrictions while leaving the EBS band's historical legacy in place is likely to yield inefficient results.

The Coase Theorem does not support reliance on secondary market transactions as a means of transitioning EBS licenses to flexible-use. The Coase Theorem predicts that, in the absence of transaction costs, unrestricted EBS licenses would eventually be acquired through secondary markets transactions by the firms who value them the most (even without an incentive auction). But, as Coase also predicted, the initial distribution of spectrum rights matters, particularly in markets with high transaction costs.⁶⁰

The secondary market for mobile spectrum licenses exhibits significant transactions costs, including bargaining problems (e.g., holdouts) and uncertainty about the final cost of assembling a broad spectrum footprint through piecemeal negotiations with multiple licensees.⁶¹ The business plans of most mobile service providers are premised on realizing economies of scope and scale—i.e., obtaining licenses within a given spectrum band that cover sufficient geography (e.g., nationwide) to justify investing in network infrastructure and devices that operate in the band. The additional costs and risks of attempting to assemble a mobile spectrum footprint through secondary market transactions lowers the price that interested buyers are willing to pay for a given spectrum license and may be sufficient to deter interested buyers from participating in the secondary markets at all.⁶²

⁶⁰ See Ronald Coase, *The Problem of Social Cost*, *Journal of Law and Economics*, Vol. III (1960).

⁶¹ See *Connecting America, The National Broadband Plan* at p. 82 (Mar. 17, 2010) (National Broadband Plan), <https://www.fcc.gov/general/national-broadband-plan>.

⁶² If the potential cost and risk are high enough (e.g., due to an existing distribution of spectrum rights), buyers that would otherwise be interested in the spectrum will forgo any attempt to participate in the secondary market.

Granting flexible-use rights to incumbent EBS licensees would promote the same economic inefficiencies that have plagued previous efforts to assign spectrum rights without a competitive bidding process. The FCC's experience with the use of lotteries to distribute Part 22 cellular licenses provides a seminal example of the inefficiencies of relying on secondary market transactions to correct deficiencies in the initial distribution of spectrum rights.⁶³ Assigning valuable cellular licenses by lottery encouraged speculators, who had no intention of providing wireless service themselves, to apply for spectrum rights.⁶⁴ Once they obtained a license, these speculators were eager to sell their spectrum rights for windfall profits, and a secondary market in FCC cellular licenses emerged.⁶⁵ It took years for secondary markets to efficiently aggregate and reassign the licenses to the parties who valued them most, which in turn led to delays in providing new mobile services to the public.⁶⁶ The social cost of these cellular licensing delays has been estimated as equivalent to two percent of Gross National Product.⁶⁷

The lottery winners' windfall profits and the inefficiency of the resulting secondary market transactions are what prompted Congress to grant auction authority to the FCC. FCC auctions increase allocation efficiency by providing interested buyers with an open and transparent opportunity to obtain a broad spectrum footprint without the higher transaction costs, bargaining problems, and aggregation uncertainty that are inherent in piecemeal negotiations.

The greater efficiency of auctions was the basis for the FCC's recommendation that broadcast licenses in the 600 MHz Band should be transitioned through an incentive auction rather than secondary market transactions.⁶⁸

Similarly, when the FCC opened its proceeding to reconfigure the 2.5 GHz band for broadband services, the agency considered using an incentive auction to transition EBS licensees due to the problems posed by the initial distribution of licenses.⁶⁹ The FCC predicted that holding a single auction for new licenses in the EBS white spaces, incumbent EBS licenses, and potentially incumbent BRS licenses, would be the most efficient way to restructure the band⁷⁰:

For example, an entity planning to use [EBS] spectrum to provide mobile services in a geographic area pursuant to newly proposed service rules currently has to obtain the license to use any spectrum previously not authorized for use in that area and has to negotiate with each incumbent

⁶³ See FCC Report to Congress on Spectrum Auctions, FCC 97-353 at pp. 7-8 (1997).

⁶⁴ *Id.* at 7.

⁶⁵ *Id.*

⁶⁶ *Id.*

⁶⁷ *Id.* at p. 8 (citing J. H. Rohlfs, C. L. Jackson & T. E. Kelley, *Estimate of the Loss to the United States Caused by the FCC's Delay in Licensing Cellular Telecommunications*, National Economic Associates, Inc. (Nov. 1991)).

⁶⁸ See National Broadband Plan at p. 82.

⁶⁹ BRS/EBS NPRM at note 581.

⁷⁰ See *id.* at ¶ 241.

licensee within the relevant area. The complexity of these negotiations likely will increase dramatically with their number, as each incumbent licensee seeks to obtain terms at least as good as all the others. Moreover, competitors seeking the spectrum for similar or other uses may enter into negotiations with the licensees. If so, it is quite possible that the circumstances of negotiation, rather than the relative value of the rights to the spectrum, may determine its final use. Even if the negotiations are successful, they likely will take considerable time, potentially delaying deployment of new services to the public and burdening the business plans of all the parties involved. In contrast, in an auction to restructure the band, the party planning new services can easily determine the current high bids for each license that covers the relevant geographic area and decide whether or not to proceed in a very short period of time.⁷¹

This reasoning remains as sound today as it was then, and it has since been demonstrated empirically by the success of the broadcast incentive auction.

A voluntary EBS incentive auction is still the most efficient way to transition restricted EBS spectrum to commercial use. Voluntary participation in the auction would be the *quid pro quo* for granting flexible-use rights to an EBS licensee.⁷² EBS spectrum that is offered in the incentive auction would be sold as new licenses with full flexible-use rights. Spectrum that is not submitted for auction would continue to be subject to the current EBS licensing restrictions (e.g., the educational eligibility and educational use requirements).

This *quid pro quo* would provide substantial incentives for EBS licensees to participate in an incentive auction voluntarily. Just like broadcasters did during the run-up to the 600 MHz auction, EBS licensees would have an incentive to investigate the commercial sale value of their spectrum, including the impact of various types of lease provisions and the length of remaining license terms, in order to compare the spectrum's flexible-use value in an incentive auction to its restricted value on the secondary market (in terms of both monetary and educational benefits). They would then be in a position to make an informed, market-based decision regarding the relative benefits of participating in an incentive auction or retaining their current licenses with restricted spectrum rights.

E. The FCC should clarify that any lease terms or conditions that could prevent EBS licensees from participating in an incentive auction are inconsistent with the FCC's spectrum licensing rules.

Unlike the broadcast incentive auction, however, it appears that most EBS licensees have countervailing incentives that would deter them from investigating the commercial sale value of their licenses or participating in an incentive auction. These countervailing incentives result from the existence of unconscionable provisions in EBS leases that hold the threat of liability over licensees' heads irrespective of the provisions' ultimate legality. These terms and conditions include, but may not be limited to,

⁷¹ BRS/EBS NPRM at note 581.

⁷² See, e.g., Evan Kwerel and John Williams, A Proposal for a Rapid Transition to Market Allocation of Spectrum, OPP Working Paper Series 38 at p. 19 (November 2002).

provisions that prohibit an EBS licensee from (1) offering its license in an incentive auction, (2) engaging in any form of negotiation or offer to sell or transfer an EBS license to a third party at any time while the lease is in effect, and (3) engaging in any activity (including policy advocacy at the FCC) that could cause the FCC to impair or refuse to renew its license. Another common provision, related to the third type in the preceding sentence, requires an EBS licensee to cooperate with the lessee on FCC matters involving the leased licenses, which may include supporting the lessee's policy opposition to holding an incentive auction. The cumulative effect of these provisions is to prevent an EBS licensee from advocating for or participating in an incentive auction due to fear of potential legal liability.

If the FCC eliminates the educational eligibility and use requirements, the public interest would be best served by an FCC order clarifying that any lease provision or combination thereof that would prevent an EBS licensee from participating in an incentive auction is inconsistent with the Commission's EBS licensing rules. This clarification would be consistent with the FCC's intent regarding EBS leases and would not materially impact reasonable EBS leasing arrangements or deter other secondary market transactions.

Permitting EBS leases to have the cumulative effect described above, however, would be:

- inconsistent with the primarily educational purpose of the Educational Broadband Service,
- inconsistent with the FCC's secondary markets policies,
- raise substantial questions regarding the compliance of EBS leases with the *de facto* control requirement in Section 310 of the Communications Act, and
- inconsistent with the right of EBS licensees to reevaluate their educational needs.

1. Primary Educational Purpose

As explained above in Section III.B, improving access to educational broadband on a targeted basis is a important reason for eliminating the educational eligibility requirement and holding an incentive auction, because it would convert the inefficient educational broadband subsidy that is implicitly provided by the EBS licensing system into an explicit and more efficient subsidy for educational broadband. Enforcing lease provisions that prevent this outcome would stop the FCC from reforming its educational broadband subsidy programs and closing the homework gap.

2. Secondary Markets Policies

Enforcing lease provisions that prohibit the sale of EBS licenses based on a change in FCC policy designed to further the nation's educational broadband goals would also be contrary to the intent of the FCC's secondary market policies. These policies were intended "to promote licensee flexibility and facilitate secondary markets where appropriate," not as a means for evading regulatory requirements or curtailing the agency's regulatory flexibility.⁷³

⁷³ See Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, FCC 04-167, 19 FCC Rcd. 17503, ¶ 17 (Sep. 2, 2004) (Second Secondary Markets Order).

While the FCC should be mindful of policies that would create sufficient uncertainty to deter parties from entering into spectrum leasing agreements in other bands,⁷⁴ it should be equally mindful of secondary markets policies that would encourage parties to structure leasing agreements in a manner that hinders FCC efforts to improve other regulatory policies (in this case, spectrum, competition, and educational broadband policies), including “cooperation” agreements that prevent non-commercial licensees from advocating for policy changes that would better serve the public interest. The FCC’s secondary markets policies and the existence of wireless service restrictions (e.g., eligibility requirements) are not limited to the Educational Broadband Service. The precedent the FCC sets here will impact the FCC’s future flexibility to reform outdated spectrum policies and conduct incentive auctions in other spectrum bands.

Enforcing lease provisions that are designed to prevent the FCC from transitioning spectrum bands through incentive auctions would send a dangerous signal to other potential spectrum lessees—that leasing restricted spectrum at artificially low rates and then convincing the FCC to lift the restrictions (while deeming unconscionable leases to be sacrosanct) is a valid means of effectively forcing the FCC to grant them valuable new spectrum rights in an inefficient manner. The FCC should not adopt a policy that encourages speculators to use spectrum leases as a low-cost and low-risk means of staking a greater claim to future flexible-use rights over other interested parties.

3. *De Facto* Control

Lease provisions that prevent an EBS licensee from offering its license in an incentive auction or for sale to a third-party for three decades also raise substantial questions regarding the lease’s compliance with the FCC’s secondary markets policies and Section 310 of the Act, which both require that a licensee retain *de facto* control over the license.⁷⁵ The FCC applies a case-by-case analysis based on the totality of the circumstances when determining whether a licensee retains *de facto* control of the spectrum it leases.⁷⁶ While the FCC does not require a licensee to maintain total control over the lessee’s *use* of the spectrum—i.e., the facilities-based control test in *Intermountain Microwave* does not apply—a licensee must “effectively retain *de facto* control of the *license* under Section 310(d), consistent with the public interest.”⁷⁷

It appears the cumulative effect of the types of provisions being considered here is to transfer control of the EBS license itself to the lessee in a manner that is inconsistent with the meaning of Section 310(d). “Although restrictions on transferring interests, rights of first refusal, and tag along rights are not *per se*

⁷⁴ See BRS Reconsideration Order at ¶ 137.

⁷⁵ See Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, Report and Order and Further Notice of Proposed Rulemaking, FCC 03-113, 18 FCC Rcd. 20604, ¶¶ 73, 135 (Oct. 6, 2003) (First Secondary Markets Order).

⁷⁶ See *id.* at ¶ 65.

⁷⁷ See *id.* at ¶ 79 (emphasis added).

indicative of control,”⁷⁸ agreements containing provisions that cumulatively are designed to force the licensee into a sale to the other party constitute a transfer of control.⁷⁹

As an illustrative example, the Pinellas County Lease raises substantial questions regarding the cumulative effect of these types of lease provisions on the degree of control that EBS licensees have over their spectrum licenses. The combination of restrictions on transfer and even mere negotiation with third parties regarding transfer, the rights of refusal and participation even after the lease is terminated, and the specific performance remedy in the Pinellas County Lease appear designed to force the EBS licensee to sell (if the eligibility restriction is lifted) or lease its spectrum license to the lessee for a period that extends beyond the termination of the license and even the lease itself. The relevant lease provisions include the following:

- The EBS licensee cannot negotiate or contract with any third party to lease, sell, assign or transfer its license, or enter into an option to do so, during the thirty-year period of the agreement (1) unless the lessee decides not to renew the lease or (2) the license is assigned to an eligible educational institution that agrees to be bound by the lease.⁸⁰
- The EBS licensee cannot assign or transfer the lease without the lessee’s consent unless it assigned to an eligible educational institution.⁸¹
- The lessee has a right of first refusal that purports to apply for two years *after* the agreement expires or is terminated (absent default by the lessee).⁸²
- The lessee has a right to participate in negotiations for sale or lease of the license that occur at any time before eighteen months *after* the agreement expires or is terminated (absent default by the lessee).⁸³
- The lessee has a right to specific performance as a remedy for a default by the licensee.⁸⁴

The cumulative impact of these lease provisions is to give the commercial lessee the right to veto any effort by the EBS licensee to lease or sell its spectrum to any commercial third party for a period of

⁷⁸ Northstar Wireless, LLC, Memorandum Opinion and Order, FCC 15-104, 30 FCC Rcd. 8887, ¶ 101 (Aug. 18, 2015).

⁷⁹ See Implementation of Section 309(j) of the Commc’ns Act - Competitive Bidding, 10 FCC Rcd. 403, ¶¶ 94-96 (1994). See also Northstar Wireless, LLC, 30 FCC Rcd. 8887 (2015), rev’d *SNR Wireless LicenseCo, LLC v. FCC*, 868 F.3d 1021, 1034–35 (D.C. Cir. 2017), cert. denied sub nom. *SNR Wireless LicenseCo v. FCC*, 138 S. Ct. 2674, 201 L. Ed. 2d 1071 (2018).

⁸⁰ Pinellas County Lease, §§ 3(a), 10(b).

⁸¹ Pinellas County Lease, § 10(a).

⁸² Pinellas County Lease, §§ 3(a), 10(b).

⁸³ Pinellas County Lease, § 3(d).

⁸⁴ Pinellas County Lease, § 20(e).

thirty-two years, no matter how much a third party might be willing to pay for the licensee's spectrum rights.

In an ordinary leasing context, such as a commercial real estate lease, the lessor would typically have the option of repudiating the lease and paying damages in light of changed circumstances (e.g., a zoning change that dramatically increases the value of the commercial real estate). Repudiation would be an attractive option for an EBS licensee whose total receipts over the thirty-year period of the lease could amount to about 10% of the spectrum's current market value if it were sold on a commercial basis (as discussed in Section III.C above). The specific performance remedy in the Pinellas County Lease, however, effectively prevents the licensee from repudiating the lease as a means of exploring an alternative sale or lease option.⁸⁵

An EBS licensee does not have *de facto* control over its license when the licensee has zero control over the license's disposition—the *sine qua non* of control—for nearly a third of a century. The only elements of “control” the EBS licensee retains over its license under the Pinellas County Lease are the licensee's obligations to the FCC.

4. Right to Reevaluate Educational Needs

Based on the *de facto* control issue discussed above, it would also appear that the Pinellas County Lease and others like it are contrary to the underlying purpose of the FCC rule requiring that EBS leases with a term of fifteen years or longer provide licensees with a reasonable opportunity to review their educational use requirements in light of changes in educational needs, technology, and other relevant factors.⁸⁶ Though the FCC has stated that an EBS spectrum lease “may include any mutually agreeable terms designed to accommodate changes in the EBS licensee's educational use requirements and the commercial lessee's wireless broadband operations,” the cumulative effect of the terms and conditions in the Pinellas County Lease ensure the reevaluation right has no substantive effect. The educational review provision in the lease provides the EBS licensee with the option of additional access to services and technologies that the lessee provides to retail customers with a proportional reduction in or refund of the lessee's payments,⁸⁷ which is the substantive equivalent of saying the EBS licensee is free to

⁸⁵ Note, however, that a court could not enforce a specific performance provision in a manner that would restrict the FCC's licensing authority. See *Radio Station WOW v. Johnson*, 326 U.S. 120, 130-31, 65 S. Ct. 1475, 1481, 89 L. Ed. 569 (1945) (noting that a state “court went outside its bounds” when it ordered the transfer of an FCC radio license to resolve a contractual dispute, because the order restricted the FCC's licensing authority). See also *Cox Broad. Corp. v. Cohn*, 420 U.S. 469, 480–81, 95 S. Ct. 1029, 1038–39, 43 L. Ed. 2d 328 (1975) (citing *WOW v. Johnson* as a category of case “in which the federal issue [transfer of an FCC license], finally decided by the highest court in the State, will survive and require decision regardless of the outcome of future state-court proceedings”).

⁸⁶ See 47 CFR § 27.1214(e). This section states: “In furtherance of the educational purposes for which EBS spectrum is primarily allocated, any spectrum leasing arrangement in excess of 15 years that is entered into on or after July 19, 2006 must include terms which provide the EBS licensee on the 15th year and every 5 years thereafter, with an opportunity to review its educational use requirements in light of changes in educational needs, technology, and other relevant factors and to obtain access to such additional services, capacity, support, and/or equipment as the parties shall agree upon in the spectrum leasing arrangement to advance the EBS licensee's educational mission.”

⁸⁷ See Pinellas County Lease at § 5(d).

purchase additional retail services from the lessee just like anyone else. This section also provides that the lessee “will not be required to accommodate changes to the Licensee’s Reserved Capacity [i.e., to the EBS licensee’s use of its spectrum for educational purposes] in a manner that has a negative impact on [the lessee or lessee’s] commercial operations under the Agreement,” which is equivalent to saying the lessee is not required to accommodate any material change in the EBS licensee’s educational needs.

The combination of the Pinellas County Lease’s educational review provision and the provisions preventing the EBS licensee from exercising any degree of control over the disposition of its license or the lease⁸⁸ effectively nullify the FCC’s intent in adopting the review condition: “to *ensure* that EBS licensees have a *fair* opportunity to re-evaluate their educational needs” in “respon[se] to changing circumstances.”⁸⁹ If an EBS licensee’s only opportunity for responding to changed circumstances is to buy additional retail services from the lessee like any other retail customer, the educational institution’s status as an educational license-holder is rendered irrelevant. As a substantive matter, the initial lease terms will govern the parties’ relationship for the entire thirty-year period of the lease irrespective of changed educational circumstances.

F. The FCC has legal authority to adopt spectrum licensing policies that impact the terms and conditions of existing spectrum leases.

Parties to the current FCC proceeding do not appear to challenge the FCC’s legal authority to impose restrictions on the terms and conditions that can be included in EBS leases. Indeed, the FCC has traditionally imposed unique conditions on EBS spectrum leases in order to preserve the service’s primarily educational purpose (e.g., the educational use requirement).

At least one party, however, implies that the FCC lacks legal authority to modify or render unenforceable the terms and conditions of existing spectrum leasing arrangements in the manner proposed above.⁹⁰ This implication is unfounded. It is settled law that the FCC is not bound by the terms and conditions of a spectrum license (and thus, cannot be bound by a spectrum lease). Though a private license agreement “is a contract governed by ordinary principles of state contract law,”⁹¹ an FCC spectrum license is not a private license agreement. Section 304 of the Communications Act provides that all spectrum licensees waive any “claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous

⁸⁸ Though the EBS licensee could transfer the license or lease to another educational institutional, it would ordinarily have no economic incentive to do so.

⁸⁹ Second BRS/EBS Order at ¶ 268 (emphasis added).

⁹⁰ See Reply Comments of Sprint Corp., WT Docket No. 18-20 at p. 10 (filed Sep. 7, 2018), <https://www.fcc.gov/ecfs/filing/10907081986545>.

⁹¹ *McCoy v. Mitsubishi Cutlery, Inc.*, 67 F.3d 917, 920 (Fed. Cir. 1995) (quoting *Power Lift, Inc. v. Weatherford Nipple-Up Sys., Inc.*, 871 F.2d 1082, 1085 (Fed. Cir. 1989)).

use of the same, whether by license or otherwise.”⁹² According to the Supreme Court, “[t]he policy of the Act is clear that no person is to have anything in the nature of a property right as a result of the granting of a license,”⁹³ and the Court has “fully recognize[d]” that the FCC “is not precluded ‘at a later date from taking any action [regarding a spectrum license] which it may find will serve the public interest.’”⁹⁴ The FCC thus has statutory authority to modify the terms and conditions of a spectrum license,⁹⁵ suspend or revoke a license,⁹⁶ and deny an application to renew a license whenever the agency determines that such action would serve the public interest.⁹⁷

It is axiomatic that “spectrum lessees cannot have any greater right to the use of licensed spectrum than the licensee.”⁹⁸ Licensees and their lessees alike are bound by the FCC’s exercise of its spectrum licensing authority, including actions to modify licenses or deny applications for their renewal, just as lessees of real property are bound by local zoning decisions that impact the leased property.

The FCC’s legal authority is not constrained by the fact that its spectrum licensing decisions might have the effect of modifying the terms and conditions of an existing spectrum lease agreement or even rendering them unenforceable as a practical matter.⁹⁹ To hold otherwise would abrogate the clear policy of the Communications Act that spectrum licensees do not create “*anything* in the nature of a property right”¹⁰⁰—i.e., that licensees have no right to be free from the impact of FCC regulation that could possibly be transferred to a lessee through a private agreement. If the FCC has authority to modify the terms and conditions of existing spectrum licenses—and it clearly does—it is axiomatic that the FCC

⁹² 47 U.S.C. § 304.

⁹³ *FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 475, 642, 60 S.Ct. 693, 697, 84 L.Ed. 869, 1037 (1940).

⁹⁴ *Ashbacker Radio Corp. v. FCC*, 326 U.S. 327, 331, 66 S. Ct. 148, 150, 90 L. Ed. 108 (1945).

⁹⁵ See 47 U.S.C. § 316.

⁹⁶ See 47 U.S.C. § 312.

⁹⁷ See 47 U.S.C. §§ 308(a), 309(a).

⁹⁸ Second Secondary Markets Order at ¶ 151, *aff’d* Second BRS/EBS Order at ¶ 267. The clause regarding previous spectrum use by “license *or otherwise*” in 47 U.S.C. § 304 (emphasis added) makes this doubly clear.

⁹⁹ Though the Supreme Court has held that an FCC licensing action could result in independent legal consequences for the parties to a spectrum lease under state law (e.g., liability for fraud), that fact does not abridge the FCC’s licensing authority. See *Regents of Univ. Sys. of Georgia v. Carroll*, 338 U.S. 586, 593, 70 S. Ct. 370, 374, 94 L. Ed. 363 (1950). Moreover, the practical applicability of *Georgia v. Carroll* is extremely limited because (1) the Court did not consider the FCC’s license modification authority under 47 U.S. § 316, *see id.* at 594, note 8 (citing the “sections pertinent to the determination of this case”); and, (2) to the extent the case could be read in a manner that would permit private parties to impose substantive limitations on the FCC’s licensing authority, the case has been reversed by statute. See *Matter of Int’l Settlement Rates*, Report and Order, FCC 97-280, 12 FCC Rcd. 19806 at ¶ 308 (Aug. 18, 1997) (noting that *Georgia v. Carroll*, which was decided in 1950, relied on the FCC’s lack of authority to issue “cease and desist” orders under Title III and that Congress later gave the FCC that authority in 1952).

¹⁰⁰ *Sanders Bros. Radio Station*, 309 U.S. at 475 (emphasis added).

may exercise that authority in a manner that impacts the terms and conditions of existing spectrum leasing arrangements.¹⁰¹

The FCC's exercise of its statutory licensing authority in a manner that impacts private lease agreements is not equivalent to adjudicating the meaning of a particular spectrum lease or interfering in a private contractual dispute that is primarily a matter of state law.¹⁰² The FCC's secondary markets policies are replete with examples of this principle. Though the parties may agree to extend the term of a spectrum leasing arrangement beyond the term of the license itself, the effectiveness of such a lease provision is contingent on an FCC finding that renewal of the license is in the public interest.¹⁰³ Though the parties to a spectrum lease may agree to assign the lease or the underlying license itself to a third-party, approval of such assignments is subject to the FCC's transaction review process.¹⁰⁴ In the event that a leased license is revoked or canceled, the lessee must "terminate its operations" and "has no greater right to obtain a comparable license than any other interested parties."¹⁰⁵ Indeed, when the FCC was presented with conflicting interpretations of various EBS lease provisions, it resolved the conflicts through a rulemaking proceeding by clarifying its rules and policies governing EBS spectrum licenses, not by interpreting particular private agreements.¹⁰⁶

The FCC's previous denial of a petition asking the FCC to expressly prohibit purchase right provisions in EBS leases does not constrain the FCC's authority or even implicate the principle of *stare decisis* in this proceeding.¹⁰⁷ The FCC's denial of the petition was not based on a finding that such lease provisions are appropriate. To the contrary, the FCC agreed with the petitioner that such provisions are "inappropriate" and noted that "specific reasons" could "justify Commission intrusion in a private contractual arrangement."¹⁰⁸ The denial rested on the FCC's finding that such provisions "can have no practical effect" because the FCC had "no intention of revisiting EBS eligibility," and thus the petitioner

¹⁰¹ See, e.g., *Bldg. Owners & Managers Ass'n Int'l v. FCC*, 254 F.3d 89, 96 (D.C. Cir. 2001) ("Where the Commission has been instructed by Congress to prohibit restrictions on the provision of a regulated means of communication, it may assert jurisdiction over a party that directly furnishes those restrictions, and, in so doing, the Commission may alter property rights created under State law.").

¹⁰² See, e.g., *Regents of Univ. Sys. of Ga. v. Carroll*, 338 U.S. at 599-603 (distinguishing between the FCC licensing actions that affect the contractual rights of a third-party and the agency's authority to determine the legal effect of its licensing decisions under state contract law). See also *Cellco P'ship v. FCC*, 700 F.3d 534, 543 (D.C. Cir. 2012) (FCC regulation that "dictates certain interactions between licensees and third parties" is "a third-party impact different in kind from the state-law contract issues at stake in *Carroll*").

¹⁰³ See First Secondary Markets Order at ¶ 141, *aff'd* Second BRS/EBS Order at ¶ 267. See also 47 C.F.R. sec. 1.9030(l).

¹⁰⁴ See First Secondary Markets Order at ¶¶ 147, 185; Second Secondary Markets Order at ¶¶ 25-27.

¹⁰⁵ First Secondary Markets Order at ¶ 187.

¹⁰⁶ See BRS Reconsideration Order at ¶¶ 134-37.

¹⁰⁷ Second BRS/EBS Order at ¶¶ 247-248.

¹⁰⁸ *Id.* at ¶ 248.

“fail[ed] to demonstrate that they result in any real public interest harm.”¹⁰⁹ The FCC also noted that, “in the extremely unlikely event that EBS license eligibility is expanded to include commercial entities, the Commission will still have the opportunity to review the transaction and decide whether allowing such a transfer would be in the public interest.” The current rulemaking proceeding provides the opportunity for just such a review in light of the significantly changed circumstances.

The FCC did not foresee revisiting EBS eligibility in 2006, because the agency did not have clear legal authority to conduct an incentive auction. At the time, the agency had no reliable means of encouraging EBS licensees to volunteer their spectrum for auction. Passage of incentive auction legislation in 2012 has since provided a proven means of transitioning EBS spectrum to commercial use in a manner that is more efficient and more appropriately honors the spectrum’s primarily educational purpose (by providing an opportunity to raise revenue for an explicit and more efficient educational broadband subsidy).¹¹⁰

To be sure, the FCC also has legal authority to determine that the public interest would be better served in a given circumstance by adopting a policy that does not impact existing spectrum leases.¹¹¹ But that determination is a policy question for the FCC to decide, not a question of state contract law. In making that policy decision, the FCC is entitled to weigh the costs and benefits of alternative approaches, and whatever decision it makes will receive broad deference on both fact and policy from a reviewing court.¹¹²

G. The FCC should clarify that EBS licenses for spectrum that is sold in the incentive auction cannot be renewed.

Some parties to the FCC proceeding have argued that an incentive auction would be unsuccessful because most EBS leases have auto-renewal provisions,¹¹³ which can extend the term of an EBS lease to a maximum of thirty years.¹¹⁴ This argument misinterprets the FCC’s auction authority and the inherent limitations of auto-renewal provisions in spectrum leases.

¹⁰⁹ *Id.* at ¶ 247-48.

¹¹⁰ See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, §§ 6402, 6403, 125 Stat. 156 (2012).

¹¹¹ See BRS Reconsideration Order at ¶ 137.

¹¹² See *Syracuse Peace Council v. FCC*, 867 F.2d 654, 658 (D.C. Cir. 1989), *cert. denied* 110 S.Ct. 717, 493 U.S. 1019, 107 L.Ed.2d 737.

¹¹³ See Reply Comments of Sprint Corp., WT Docket No. 18-20 at p. 9 and note 36 (filed Sep. 7, 2018), <https://www.fcc.gov/ecfs/filing/10907081986545>.

¹¹⁴ See 47 C.F.R. § 27.1214(e).

First, the FCC's auction authority is limited to "initial" licenses and does not apply to modifications made to existing licenses.¹¹⁵ Second, extension of a spectrum leasing arrangement beyond the term of a license authorization is "contingent on the Commission's grant of the license renewal."¹¹⁶

To alleviate confusion regarding the application of these provisions, the FCC should clarify that the incentive auction will offer new, initial licenses with flexible-use rights (i.e., the FCC would not be modifying the existing EBS licenses to which the existing leases pertain). The FCC should also clarify that it will not accept applications for renewal of restricted EBS licenses with spectrum assignments that correspond to a new license sold in the incentive auction. Full use of the new licenses would be subject to the expiration of the corresponding EBS licenses at the end of their current terms. In accordance with the FCC's secondary markets policies, EBS leases associated with such licenses would automatically expire when the license expires.

H. Honoring existing spectrum leases would not prevent the FCC from holding a successful EBS incentive auction.

With the appropriate and limited clarifications proposed above, existing EBS leasing arrangements would not prevent the FCC from holding a successful incentive auction. The FCC has previously had great success auctioning spectrum that was subject to encumbrances during transition periods involving incumbent spectrum users, including (among others) the initial auction of AWS-1 spectrum in Auction 66 (subject to an indefinite transition period for relocation of federal spectrum users and fixed microwave licensees)¹¹⁷ and the auction of 600 MHz licenses in the broadcast incentive auction (subject to a thirty-nine month transition period for relocation of incumbent broadcasters).¹¹⁸ Past experience and the enormous potential for 5G deployment in the 2.5 GHz band indicate that potential bidders would be similarly undeterred by post-auction delays in the full availability of EBS spectrum.

For EBS spectrum that is subject to a lease agreement, the FCC could condition full use of a new flexible-use license on the earlier of (1) the expiration of the restricted EBS license (and thus, the concurrent expiration of the lease) or (2) any other termination of the lease.

The first option would have the effect of requiring a winning bidder to honor an existing lease until the expiration of the EBS licensee's current license term (an absolute maximum of ten years). Past auctions indicate this would not present an intolerable period of delay for EBS licenses that will expire within four- to five-years after the auction is concluded.

¹¹⁵ See 47 U.S.C. § 309(j)(1).

¹¹⁶ 47 C.F.R. § 1.9030(l).

¹¹⁷ See Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, Report and Order, FCC 03-251, 18 FCC Rcd. 25162, ¶¶ 47-54 (Nov. 25, 2003).

¹¹⁸ See Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, Report and Order, FCC 14-50, 29 FCC Rcd. 6567, ¶ 525 (Jun. 2, 2014).

Under the second option, the FCC would require EBS licensees to consent to early termination of their leases as a condition of submitting their license for auction. Winning bidders would then have the option of obtaining consent from EBS lessees for early termination of their leases. Qualcomm successfully used a similar approach during the DTV transition by obtaining the consent of broadcast licensees to accept the potential for additional interference caused by Qualcomm's early use of its 700 MHz licenses.¹¹⁹

To be sure, the costs and risks associated with secondary markets transactions would likely depress auction prices for leased EBS licenses with remaining license terms that exceed five years. For licenses that have a higher commercial value than their value to a particular lessee, however, the EBS lessee and licensee would have an incentive to agree in advance of the auction to early termination of the lease (e.g., by negotiating to split the auction proceeds contingent on sale of the spectrum) in order to maximize the spectrum's potential sale price. The FCC could provide an opportunity for EBS licensees and lessees to file or certify that they have jointly agreed to early termination of their leases before submitting the leased spectrum for auction in order to make this information available to bidders in the "forward auction."

Participating EBS licensees could also be required to notify the FCC if their licenses are subject to leases that contain rights of first refusal.¹²⁰ These rights could be honored through the post-auction payment process by giving the lessees an opportunity to assume all of the obligations associated with the winning bid.

I. The FCC should adopt county-sized geographic license areas for new EBS licenses.

County-sized geographic license areas would be appropriate for an incentive auction of EBS spectrum. Counties would offer reasonably granular areas for the purpose of reconfiguring incumbent EBS licenses. Counties would also match the licensing scheme in the 3.5 GHz band, which has similar propagation characteristics and is expected to support similar uses cases.¹²¹

J. The FCC should consider reconfiguring EBS licensees' circular geographic service areas based on the weighted MHz-pops methodology it recently adopted for the 39 GHz band.

The FCC should consider reconfiguring EBS licensees' circular geographic service areas based on the weighted MHz-pops methodology it recently adopted for reconfiguring incumbent licenses in the 39

¹¹⁹ See, e.g., Letter to Michael E. Carosella, DA 07-3792, 22 FCC Rcd. 16214 (Aug. 31, 2007) (approving consent agreements between Qualcomm and broadcasters in the Washington, D.C.-Baltimore, MD area).

¹²⁰ See, e.g., Second BRS/EBS Order at ¶ 270 (permitting EBS leases to contain rights of first refusal).

¹²¹ See Promoting Investment in the 3550-3700 MHz Band, Report and Order, FCC 18-149 (Oct. 23, 2018).

GHz band.¹²² One advantage of this method is that it could be used to eliminate the guard band channels (J and K), which are largely unnecessary given the limited amount of high-power broadcast use that remains in the band.

Reconfiguration could be done on a county-by-county basis rather than by Partial Economic Area in the 39 GHz band. For EBS licensees with a local presence, consolidation of geographically-separated licenses would be avoided.

To encourage EBS licensees to participate in the auction, the FCC could tailor the *de minimis* exceptions to licensees' choices. The *de minimis* lines could be drawn more expansively for licensees who elect to participate in the incentive auction and more narrowly for licensees who opt out of the auction (though not so narrowly as to reduce the incumbent licensee's total weighted MHz-pops by more than a truly *de minimis* amount).

EBS licensees would have the same basic options regarding participation in the incentive auction as incumbent licensees in the 39 GHz band. An EBS licensee would reconfigure its license according to the FCC's default proposal or its own proposal and either (1) forgo participation in the incentive auction and remain subject to EBS licensing restrictions, or (2) agree to relinquish the reconfigured license (and voluntarily terminate its lease rights, if any) in exchange for an incentive payment and/or auction voucher.

To the extent there are EBS licensees who are still providing non-duplicative educational broadcast services, the FCC could provide them with an additional option to opt-out of the (otherwise mandatory) reconfiguration and grandfather their current broadcast operations. In areas affected by grandfathered broadcast operations, the FCC could auction license overlays. This option would prevent disruption of remaining educational broadcast services in the short-term and rely on secondary market transactions to transition this spectrum in the long-term (despite their relative inefficiency).

K. The FCC should consider conditioning the T-Mobile-Sprint merger on the voluntarily termination of the new company's lease rights with respect to the sale of an EBS license to a third-party.

The FCC's spectrum screen and merger precedent indicate that, if the merger of T-Mobile and Sprint is approved, the new company will be required to divest substantial amounts of spectrum. Divestiture orders are ordinarily aimed solely at preserving competition. In the unique circumstances surrounding this merger, however, requiring the new company to divest spectrum by voluntarily terminating its lease rights with respect to the sale of EBS licenses to third-parties would help to preserve competition while promoting other important policy goals.

¹²² See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, Fourth Report and Order, FCC 18-180, ¶¶ 15-36 (Dec. 12, 2018), <https://docs.fcc.gov/public/attachments/FCC-18-180A1.pdf>.

Removing the encumbrance of Sprint's leases would encourage EBS licensees to participate in an incentive auction by tending to increase the value of their spectrum. An increase in participation by incumbent licensees would, in turn, tend to increase the value of the EBS white spaces by increasing the likelihood that a bidder would be able to aggregate a substantial spectrum footprint in the band. The virtuous circle would be completed by using the additional revenue to help close the homework gap through an explicit, needs-based subsidy program.