MERCATUS CENTER
George Mason University

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Representatives Fred Upton and Greg Walden
Energy & Commerce Committee
United States House of Representatives

Dear Chairman Upton and Chairman Walden:

Thank you for the opportunity to respond to the committee's questions on these important topics. The Technology Policy Program of the Mercatus Center at George Mason University is dedicated to advancing knowledge about the effects of regulation on society. As part of its mission, the program conducts careful and independent analyses that employ contemporary economic scholarship to assess legislation and regulation from the perspective of the public interest. Therefore, this response does not represent the views of any particular affected party but is designed to assist Congress as it explores these issues.

Please find my responses to some of your spectrum policy questions attached below. The Mercatus Center has published scholarship on communications law reform for several years. The scholars in our Technology Policy Program and our affiliated scholars would be happy to elaborate on communications policy recommendations, should the opportunity arise.

Thank you for initiating discussion about updating the Communications Act and United States spectrum policy. Policy reform can give America's spectrum-dependent technology and telecommunications sectors a predictable and technology-neutral legal framework. When Congress replaces command-and-control rules with market forces, consumers will be the primary beneficiaries.

Sincerely,

Brent Skorup
Research Fellow, Technology Policy Program
Mercatus Center at George Mason University

Former senior Federal Communications Commission (FCC) officials Gerald Faulhaber and David Farber noted without irony that US spectrum policy resembles GOSPLAN, the Soviet planning agency that distributed scarce inputs to producers in every sector of the Soviet economy.[1] The woeful inefficiencies and waste resulting from the current system of regulatory allocation are predictable, yet avoidable.

It is unfortunate that Congress and the FCC have largely permitted the tremendous waste of spectrum resources for decades instead of freeing most spectrum for allocation via market processes. The US spectrum industrial policy, surviving mostly unevolved since 1927, severely distorts the 21st century technology industry and penalizes consumers with higher prices, less effective wireless competition, and fewer innovative devices.

Congress has made some efforts to liberalize spectrum allocation and has permitted auctions for some bands since 1993. The FCC, also, has permitted more so-called flexible use allocations, which allow licensees to use their wireless assets for essentially any commercially viable service. This liberalization, while welcome, is insufficient and incremental. Freeing most or all commercial spectrum would unleash waves of investment and technological innovation. There is no technical reason why the FCC needs to define, after years of deliberation and reams of rules, whether bands are used for, say, satellite television and not smartphones or GPS or taxi dispatch radios. The finite amount of spectrum does not necessitate government allocation any more than the finite amount of beef, wheat, and vegetables requires the government allocation of groceries.[2] Spectrum is an input, just like any other, that firms can combine, lease, and sublease in incalculable and innovative ways to bring services to businesses and consumers. Liberalizing spectrum rules would allow businesses and consumers to enjoy these benefits.

2. There is vigorous debate over the appropriate role for unlicensed spectrum in the wireless ecosystem, particularly following the passage of the Spectrum Act. The Act requires the FCC to auction all spectrum made available by the incentive auction, but allows for unlicensed use in guard bands. Some contend that there is an ample amount of unlicensed spectrum available and that assigning spectrum via exclusive licensing is the most effective, efficient, and economically responsible way to allocate spectrum. Others argue that repurposed spectrum should be allocated for unlicensed use for similar reasons. What role should unlicensed spectrum play in the wireless ecosystem? How should unlicensed spectrum be allocated and managed for long-term sustainability and flexibility?

There are several economic coordination problems posed by unlicensed spectrum that largely do not apply to licensed bands.[3] The first is that the most useful unlicensed bands often become filled

[1] Gerald R. Faulhaber & David Farber, "Spectrum Management: Property Rights, Markets, and the Commons" (Telecommunications Policy Research Conference Proceedings, 2002), 5, http://assets.wharton.upenn.edu/~faulhabe/SPECTRUM_MANAGEMENTv51.pdf (citations omitted).

[2] See Ronald H. Coase, "The Federal Communications Commission," *Journal of Law & Economics* 2 (1959): 1–14.

[3] This comment is not arguing for zero unlicensed spectrum. The analysis is intended to illustrate costly issues frequently ignored by or unknown to participants in spectrum policy discussions.

with devices competing for transmissions—a situation approaching a tragedy of the commons[4]—creating the need for even more unlicensed bands. In the 2.4 GHz band, for example, so many devices—like Bluetooth devices, cordless phones, and baby monitors—are using the spectrum that technology experts advise consumers to avoid 2.4 GHz and use devices on other unlicensed bands.[5] Cisco, a major producer of network equipment for unlicensed uses, regards unlicensed spectrum as "a great success so far" but likewise remarks upon the three most popular unlicensed bands that, "Just as everyone moved from 900 MHz to 2.4 GHz to avoid interference, the 'band jumping' effect will catch up with 5 GHz."[6]

In contrast, overuse is significantly mitigated in licensed bands since congestion and dropped signals are bad for business. Flexible use licensed bands[7]—like those used for smartphones and cellphones—also become congested as devices and applications drive more consumer demand. Licensed bands, however, permit licensees to mitigate spectrum congestion through technology improvements—say, from analog to digital transmissions and from 3G to more efficient 4G LTE—and through incentivizing device replacement.

T-Mobile, for instance, after acquiring smaller carrier MetroPCS in 2013, migrated 3.5 million MetroPCS customers off of MetroPCS's aging and congested network and onto T-Mobile's more efficient 4G networks through a phone replacement program.[8] This freed up spectrum for new and existing T-Mobile customers since MetroPCS devices were no longer in use. Remarkably, T-Mobile upgraded users' devices and repurposed MetroPCS's 1900 MHz spectrum assets in a matter of months.[9]

There is no analogous example, to my knowledge, of spectrum-clearing in unlicensed bands. Indeed, contrast T-Mobile's repurposing of MetroPCS spectrum with the interference-prone 900 MHz and 2.4 GHz unlicensed bands, where sometimes decades-old baby monitors and cordless phones are still used, in addition to newer wifi and Bluetooth devices. Short of going door-to-door nationwide to retrieve those devices, those bands will be overcrowded with interfering devices for the foreseeable future.

Unlicensed spectrum and devices create substantial consumer and economic value. However, the benefits of unlicensed spectrum are only one side of the ledger. Allocating unlicensed spectrum means not only forgone auction revenue in a time of strained federal budgets, but also foregoing

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[4] See also Jerry Brito, "The Spectrum Commons in Theory and Practice," *Stanford Technology Law Review* 2007 (2007).

[5] Lisa Phifer, "Abandoning the 2.4 GHz junk band – Moving Wi-Fi to 5 GHz," *Webtorials*, May 2013, http://www.webtorials.com/content/2013/05/abandoning-the-24-ghz-junk-band---moving-wi-fi-to-5-ghz.html ("It's time to start weaning legacy devices off the 2.4 GHz junkband [sic], using reduced 2.4 capacity, band-steering and better performance at 5 GHz as carrots to speed that migration."); Glenn Fleishman, "Understanding Wi-Fi's Two Spectrum Bands," *PCWorld*, May 20, 2009, http://www.pcworld.com/article/165240/article.html (advising wifi users to switch their Apple devices from the 2.4 GHz unlicensed band to the less-congested 5 GHz unlicensed band).

[6] Cisco, "20 Myths of Wi-Fi Interference," available at http://www.cisco.com/c/en/us/products/collateral/wireless/spectrum-expert-wi-fi/prod_white_paper0900aecd807395a9.pdf.

[7] "Licensed bands," in this context, should be construed as "flexible use licensed bands."

[8] Mike Dano, "T-Mobile Notches 1.6M New Subs in Q4, Will Shutter 3 MetroPCS CDMA Markets This Year," *Fierce Wireless*, February 25, 2014, http://www.fiercewireless.com/story/t-mobile-notches-16m-new-subs-q4-will-shutter-3-metropcs-cdma-markets-year/2014-02-25; T-Mobile, "Migration of MetroPCS Customers to Nationwide 4G HSPA+ and LTE Network Ahead of Schedule," news release, June 14, 2013, http://newsroom.t-mobile.com/phoenix.zhtml?c=251624&p=irol-newsarticle&ID=1829966.

[9] Dano, "T-Mobile Notches 1.6M New Subs," February 25, 2014.

the social and economic value of licensed, flexible-use allocation, which is substantial.[10] These realities led senior FCC policy advisors Evan Kwerel and John Williams to conclude,

> Some special administrative provisions for low-powered devices may be efficient in a market system. However, in making decisions about the amount of spectrum allocated to unlicensed use, the government should face the opportunity cost of limiting or foreclosing other use . . . . Future expansion of dedicated spectrum for unlicensed use could be obtained through . . . a licensee . . . charg[ing] manufacturers a fee for the right to produce and market devices to operate in that band.[11]

This recommendation—some public or private party should coordinate low-power, unlicensed devices—should be an important consideration in future unlicensed allocations.

Further, while unlicensed spectrum has benefits, allocating spectrum for unlicensed use has featured costly failures as well. For instance, the FCC allocated 30 MHz for unlicensed personal communication services (U-PCS) in the 1990s. The band generated very little economic activity and it took years before the FCC even approved a device for the 10 MHz portion allocated for data transmissions.[12] Meanwhile, the adjacent *licensed* PCS spectrum provides service for millions of cellphone subscribers.[13]

A serious and growing problem is that unlicensed allocations frustrate market transactions since there is typically no band manager in unlicensed bands. The infamous, multibillion dollar failure of LightSquared in 2012 was caused by the allocation of spectrum for unlicensed devices—GPS receivers using spectrum adjacent to LightSquared's spectrum.[14] That episode illustrated how unlicensed users, unlike licensed users like MetroPCS, make repurposing spectrum for other services nearly impossible.

The technical debates about interference between GPS and LightSquared's proposed LTE mobile phone network miss the fundamental problem. The economic waste and bankruptcy resulted because of the nature of the rights the FCC allocated for GPS: LightSquared had no single GPS band manager to bargain with because GPS devices are unlicensed and sold by many companies to millions of consumers and businesses. Much like no one is able to go door-to-door to remove old baby monitors and cordless phones in other unlicensed bands, LightSquared could not reasonably track down and compensate millions of GPS users in order to mitigate interference issues with the proposed LightSquared cellphone network. Nor could millions of GPS users effectively coordinate to pay LightSquared to use a lower-powered phone network that wouldn't interfere with their GPS

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[10] Economists estimated in 2009 that the wireless phone market yields an annual consumer surplus of at least $150 billion. Thomas W. Hazlett and Roberto E. Muñoz, "A Welfare Analysis of Spectrum Allocation Policies," *RAND Journal of Economics* 40 (2009): 424–25. More licensed spectrum and technology upgrades since 2009 presumably increased this figure.

[11] Evan Kwerel and John Williams, "A Proposal for a Rapid Transition to Market Allocation of Spectrum" (OPP Working Paper No. 38, Federal Communications Commission, Washington, DC, 2002), 7–31.

[12] Thomas W. Hazlett, "Optimal Abolition of FCC Spectrum Allocation," *Journal of Economic Perspectives* 22 (2008): 103–14.

[13] Ibid.

[14] See Thomas W. Hazlett and Brent Skorup, "Tragedy of the Regulatory Commons: LightSquared and the Missing Spectrum Rights" *Duke Law & Technology Review* (forthcoming, 2014), http://iep.gmu.edu/wp-content/uploads/2013/04/Tragedy-of-the-Regulatory-Commons-Hazlett-and-Skorup.pdf.

devices. In sum, "with spectrum use rights defined in small, fragmentary, non-exclusive slices, economic reorganization . . . is impossible due to prohibitive transaction costs."[15]

Licensed spectrum permits secondary markets in spectrum, but the presence of unlicensed devices can prohibit welfare-improving market activity. We needn't merely imagine what might have happened if LightSquared was dealing with a licensee, as opposed to unlicensed users, on the adjacent GPS spectrum. Inmarsat, a satellite licensee, was also using spectrum adjacent to LightSquared's spectrum for satellite phone and data services. LightSquared agreed to pay Inmarsat over $300 million to clear Inmarsat devices from the spectrum, which permitted Inmarsat to upgrade their users' devices to those that used different spectrum bands.[16] Had there been a licensed GPS band manager to bargain with, the United States might have another national wireless carrier today—not a multi-year bankruptcy proceeding and the destruction of billions in capital investment.

When there are no band managers to coordinate and internalize the benefits and costs of replacing or removing devices, technology stagnates, deals fall apart or are never considered, and consumers lose out. Several academics have made this argument and the scholar consensus seems to be that with some tweaks to the unlicensed rules, like the ones Kwerel and Williams, Faulhaber and Farber,[17] or De Vries and Weiser[18] describe, the FCC could permit the consumer benefits that low-power unlicensed technologies like wifi create. Crucially, the FCC should change its rules so that there is one band manager or a consortium of band managers[19] that can replace consumer devices when bands get congested.

3. Spectrum sharing is one proposed technological solution that addresses the issue of spectrum scarcity and encourages efficiency. There are multiple ways to share spectrum, including geographic sharing, temporal sharing, and sharing through dynamic spectrum access. In July 2012, the President's Council of Advisors on Science and Technology (PCAST) issued a report on ways to realize the full potential of government held spectrum. The report concluded that sharing is the most efficient way to utilize spectrum and directed the Secretary of Commerce to immediately identify 1,000 MHz of federal spectrum for shared use.

However, others assert that spectrum sharing is only part of the solution to spectrum scarcity and that clearing unused or underused federal for exclusive commercial use is a vital part of any strategy for maximizing spectrum resources. In order to enable

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[15] Ibid.

[16] Sarah Young and Paul Sandle, "Inmarsat's LightSquared deal activated," *Reuters*, August 18, 2010, http://uk.reuters.com/article/2010/08/18/uk-inmarsat-idUKTRE67H2W820100818.

[17] Gerald R. Faulhaber and David Farber, "Spectrum Management: Property Rights, Markets, and the Commons" (Telecommunications Policy Research Conference Proceedings, 2002), 17–18, http://assets.wharton.upenn.edu/~faulhabe/SPECTRUM_MANAGEMENTv51.pdf.

[18] J. Pierre de Vries and Philip J. Weiser, "Unlocking Spectrum Value through Improved Allocation, Assignment, and Adjudication of Spectrum Rights" (Discussion Paper 2014-01, The Hamilton Project, Washington, DC, 2014), 18, http://www.brookings.edu/~/media/research/files/papers/2014/03/24%20unlock%20spectrum%20value%20through%20improved%20allocation/thp_devriesweiserdiscpaper.pdf (recommending the use of "band agents" to represent unlicensed users and permit economic bargaining).

[19] See de Vries and Weiser, "Unlocking Spectrum Value," 2014, 18.

this sort of reallocation, bipartisan legislation has been introduced in the House that would allow government spectrum users an option to relinquish spectrum and receive a portion of net auction revenues instead of relocation costs, a structure similar to that of the broadcast television spectrum incentive auctions. What should be done to encourage efficient use of spectrum by government users?

PCAST did not conclude simply that spectrum "sharing" is the way forward in spectrum management. As this question states, there are several ways to share federal spectrum, including geographic sharing, temporal sharing, and sharing via dynamic spectrum access. PCAST instead concludes that dynamic spectrum access is the superior method of sharing,[20] a hasty conclusion given the complex problems posed by this young technology.

PCAST and others draw a false distinction between "sharing" and "exclusive licenses."[21] In fact, every wireless user and so-called exclusive use licensee is sharing spectrum with several other licensees and millions of other users.[22] A Washington, DC Verizon customer checking Facebook on her smartphone on her after-work bus commute is sharing the "exclusive," licensed 700 MHz and AWS-1 bands with thousands of other users in DC—namely, other Verizon customers, as well as T-Mobile and AT&T customers. "Licensing does not preclude sharing; it often facilitates it."[23]

The relevant question is not, Should there be more spectrum sharing; it is, Who should coordinate spectrum sharing—regulatory authorities or market participants? As the hundreds of millions of users of cellphones and smartphones reveal, market participants with exclusive, flexible licenses have developed institutions and technologies that promote intensive sharing of the licensed airwaves.

Regarding the PCAST recommendations, Faulhaber states, "In essence, the [PCAST] conclusion is that some form of *government-mandated and controlled sharing* is to be implemented. There is no evidence presented for this conclusion."[24] Unfortunately, regulatory authorities using command-and-control—relying on the advocacy of interested parties, not markets—too often provide frequency sharing that only increases the chances of interference and conflict. PCAST's recommendations would largely exacerbate government interventions.

Having spectrum neighbors or co-tenants via mandate dramatically increases the cost, time, and complexity of interference agreements. Gaining regulatory approval to operate on these slivers of spectrum with other parties is especially difficult. As a prominent legal scholar quipped,

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[20] President's Council of Advisors on Science and Technology, "Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth" (2012), 11, http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf.

[21] Ibid., vi–29.

[22] Gerald R. Faulhaber, "The Spectrum Opportunity: Sharing as the Solution to the Wireless Crunch," *International Journal of Communication* 8 (2014): 116–21 ("Sharing is often the commercial norm. Licensing does not preclude sharing; it often facilitates it."); Thomas W. Hazlett, "Spectrum Tragedies," *Yale Journal on Regulation* 22 (2005): 242–49, ("Common access among millions of subscribers is organized by network operators . . . .").

[23] Faulhaber, "Spectrum Opportunity," (2014).

[24] Ibid., 17.

"negotiating spectrum sharing is like getting past robber barons on the Rhine. Deals are so complicated that they often don't get done."[25]

Sharing with federal agencies, particularly the Department of Defense, is especially problematic since agencies' use of spectrum is often related to the protection of life and property.[26] Faulhaber states the crux of the problem: "Federal agencies gain nothing from sharing; they received the spectrum for free, no one monitors their use of it, and no one apparently has the power to take it away from them. Bottom line: Actual sharing of federal spectrum is highly unlikely."[27]

The travails of ultrawideband (UWB) are illustrative.[28] UWB is a wireless low-power technology used for ground-penetrating radar and data services. Beginning in 1989, its proponents sought regulatory approval to share federal spectrum for UWB commercial applications. UWB uses huge portions of spectrum but is very low power—transmissions from a cellphone are millions of times more powerful than UWB transmissions. Even then, UWB applicants were subjected to a process that can only be described as Kafkaesque as it went—for 13 years—agency to agency, submitting filings and completing interference tests, attempting to show that the technology would not threaten federal operations.

Indicative of agency foot-dragging, a UWB manufacturer noted,[29]

> It took NTIA nearly a year to obtain internal sign off by government users of spectrum to approve with conditions the requests for waivers submitted by [UWB] companies. This despite the fact that the devices . . . were lifesaving instruments for public safety and law enforcement personnel, and all 2500 devices requested, if operating together in a single room, would emit less than one quarter the power of a cell phone.

Eventually, UWB was permitted to share federal spectrum, but not until after that UWB applicant made over 100 trips to DC in six years and spent millions of dollars to push his technology. Another large UWB company backed by Intel went out of business in the meantime. The ordeal led to a 2002 hearing by the House Energy and Commerce Committee where committee chairman Tauzin stated, "I watched this [UWB] proceeding with more than a small degree of horror. . . . [U]ltrawideband has been met with the fiercest resistance of any technology in recent history."[30]

Widespread sharing between commercial users and federal agencies with dynamic sharing technologies simply is not ready for prime-time[31] (though research should continue). Technology

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[25] Michael Heller, *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives* (New York: Basic Books, 2008), 98.

[26] See Brent Skorup, "Bad News from Obama's memo on federal spectrum," *Technology Liberation Front*, June 19, 2013, http://techliberation.com/2013/06/19/bad-news-from-obamas-memo/.

[27] Faulhaber, "Spectrum Opportunity," 2014.

[28] See "The FCC's UWB Proceeding: An Examination of the Government's Spectrum Management Process," (Serial No. 107-114, Hearing Before the Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, House of Representatives, June 5, 2002), http://www.gpo.gov/fdsys/pkg/CHRG-107hhrg80674/pdf/CHRG-107hhrg80674.pdf.

[29] Ibid., 42.

[30] Ibid., 3.

[31] Faulhaber, "Spectrum Opportunity," 2014 ("While these [dynamic sharing] technologies have been known in the laboratories for decades, very few are actually used commercially. Some are so complex that practitioners don't expect them to be deployed for many years."); Peter Rysavy, "Spectrum Sharing: The Promise and the Reality," (Rysavy Research, 2012), http://www.rysavy.com/Articles/2012_07_Spectrum_Sharing.pdf.

has improved in the interim decade since UWB was approved and someday dynamic and temporal sharing may be relatively cheap and safe. As the Commerce Spectrum Management Advisory Committee (CSMAC) proceedings reveal, however, federal users jealously guard their spectrum from possible interference from commercial users.[32] Michael Marcus, an electrical engineer who worked at the FCC for over two decades has written that the possibility of using dynamic sharing techniques, like PCAST recommends, may someday permit commercial users to share spectrum with federal users. Alas, at present, the very conservative limits that agencies impose on commercial users mean that fluctuations in commercial capacity will be a serious issue and harm commercial interest.[33] The possibility of federal agencies permitting widespread sharing with commercial carriers for wireless broadband via, say, 4G LTE deployment is remote.

As this committee knows, federal users do not use their spectrum efficiently. There are policy alternatives that do not require accepting the undesirable status quo and waiting for dynamic spectrum technologies to develop. A few of those alternatives are described below.

4. Given the enormous economic benefits of innovation spurred by commercial spectrum availability, both the government and the private sector are concerned with making more spectrum available to meet commercial demand. When discussing available resources, the FCC considers spectrum to be "currently available" if providers have the legal authority to build out and provide services using that band, or "in the pipeline" if it is not currently available for commercial services but there are government plans to make it available to commercial providers within the next three years. Congress and the FCC have worked to increase the amount of spectrum available to commercial providers, including through the provisions for auctions and relocation in the Middle Class Tax Relief and Job Creation Act. What other steps can be taken to increase the amount of commercially available spectrum?

The FCC could auction off overlay licenses to spectrum currently utilized by commercial and federal users.[34] Winners of overlay licenses would receive the right to use unoccupied frequencies while avoiding frequencies and geographic areas that are occupied by incumbents.[35] The overlay licensee would also receive the right to bargain with the incumbent users over in-kind or pecuniary compensation. After a deal is reached, the incumbent would relocate or cease operations. The FCC does not need a new statute to accomplish this in most commercial spectrum bands, but congressional approval or encouragement would bring certainty to the process.

For federal incumbents, Congress might also consider proposals similar to "BRAC the spectrum," whereby a panel of spectrum experts would recommend bands of spectrum where federal

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[32] Brent Skorup, "Reclaiming Federal Spectrum: Proposals and Recommendations," *Columbia Science & Technology Law Review* 15 (2013): 90, 115–16, http://www.stlr.org/html/volume15/Skorup.pdf ("Even in the satellite bands, however, where [temporal sharing] is most likely, the CSMAC working group found temporal sharing to pose substantial challenges, particularly the unproven nature of the technology.") (internal citation omitted).

[33] Michael J. Marcus, "Sharing Government Spectrum with Private Users: Opportunities and Challenges," *IEE Wireless Communications* 16 (2009): 4.

[34] See Brent Skorup, "Getting Away from GOSPLAN," *Regulation* (2014): 18–19, http://object.cato.org/sites/cato.org/files/serials/files/regulation/2014/1/regulation-v36n4-7.pdf.

[35] See Hazlett, "Optimal Abolition," 2008, 103 (discussing overlay licenses as an alternative to the broadcast television incentive auction).

incumbents would be removed.[36] Giving a panel of experts congressional authority to clear federal users would speed up the process of increasing the amount of commercial spectrum.

In the long-term, agencies need to relinquish their spectrum and pay approximately market rates for the resource. As Thomas Hazlett, a former FCC chief economist, and I recently wrote,

> Spectrum is an input into an output. It is that output, wireless communication, that the government agency needs to consume. It is difficult to know, objectively and from outside an actual situation, how much of each ingredient is the right amount to use. It is impossible to know what will be the right amount (or type of spectrum) in the future. Better to let markets configure the inputs, and governments to buy the outputs. . . .
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> The present alternative locks in a given amount of spectrum and then directs agencies to construct their own network from there. It makes no more sense than shipping police departments specified quantities of auto parts, mandating that they use this much—no more, no less, no different—for the construction of police cars.[37]

To the extent agencies need their own spectrum, scholars have proposed ideas like an agency that holds spectrum on behalf of federal agencies and leases spectrum at approximately market rates to the agencies that require spectrum.[38]

5. In order to issue spectrum licenses, the Communications Act requires the FCC to make an affirmative finding that granting the license serves the public interest, convenience, and necessity. Moreover, the Act prohibits the FCC from basing its finding on the expectation of auction revenues. Should the Act permit the FCC to use expected auction revenue as the basis for a public interest finding? What criteria should the FCC consider as part of its analysis?

The FCC's public interest standard is infamously vague and causes tremendous amounts of rent-seeking. Federal law states that no spectrum assignment can be transferred "except upon application to the Commission and upon finding by the Commission that the public interest, convenience, and necessity will be served thereby."[39] Legal scholar and former congressional investigator Bernard Schwartz noted decades ago that this public interest standard "gives the Commission well-nigh complete latitude to act in individual cases as it wishes—and it is not even subject to the need for maintaining the corpus of its law consistent."[40]

The FCC "was created by the Communications Act for the purpose of regulating broadcasting in the public interest."[41] As the FCC has said, "the underlying purpose of the Communications Act [is] to

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[36] Skorup, "Reclaiming Federal Spectrum," 2013, 90.
[37] Hazlett and Skorup, "Tragedy of the Regulatory Commons," 2014, 13–14.
[38] Skorup, "Reclaiming Federal Spectrum," 2013, 90 (describing a proposal to create a GSA-like agency that leases out spectrum to federal users).
[39] 47 USC § 310(d). See 47 CFR § 1.945(c) ("The Commission will grant the [license] application without a hearing if . . . the Commission finds . . . that . . . [a] grant of the application would serve the public interest, convenience, and necessity.").
[40] Bernard Schwartz, "Comparative Television and the Chancellor's Foot," *Georgetown Law Journal* 47 (1959): 655–57.
[41] Ibid., 655.

effectuate the policy against monopolization of broadcast facilities . . . ."[42] That 80 year-old justification is archaic in a world of hundreds of cable channels and radio programs and countless sources of online content. As long as the public interest standard remains, FCC commissioners will continue to use noneconomic and anticonsumer factors in licensing decisions. The FCC should be required to judge licensing decisions according to a consumer- or social-welfare competition standard, much like the antitrust agencies judge competitive behaviors.

> **6. The FCC's existing process manages spectrum use through allocation and assignment—bands are allocated for specific services or classes of users, and licenses for use of specific portions of spectrum are assigned to entities. Many of the existing allocations were made because certain spectrum bands are better suited for certain uses. However, changes in technology have changed assumptions over the years. While restrictions have eased in recent years, there are still certain limited-use spectrum licenses. Flexible use licenses permit licensees to use their spectrum for any service, including wireless, broadcast, or satellite services. Should all FCC licenses be flexible use? In what instances should the Commission exercise control over the service offered? How can the Act enable better use of spectrum, either flexible or specified?**

The committee understates the problem. Hazlett points out that "the overwhelming proportion of economically important bandwidth is reserved for limited and specific uses, unavailable for market allocation."[43] A 2003 FCC staff report likewise concluded that "the command-and-control model currently dominates today's policy."[44] This Soviet-style industrial planning results in tremendous waste and rent-seeking.[45]

All commercial licenses should be flexible use in order to permit firms to freely upgrade equipment, sell spectrum assets, and deliver new wireless services as consumer demands change. To the extent Congress observes unmet social needs with implications for wireless policy—like local news, phone service for the poor, and public safety communications—those needs should be subsidized directly by state and federal governments. Carving out bands of spectrum to promote social needs distorts the supply and economic value of wireless services and should be discontinued promptly.

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[42] FCC, *In the Matter of 1998 Biennial Regulatory Review – Review of the Commission's Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996*, MM Dkt. No. 98-35, 15 FCC Rcd 11058, 11067 (2000) (quoting Amendment of Multiple Ownership Rules, 9 RR 1563 (1953)). See also NBC v. United States, 319 U.S. 190, 219 (1943) (quoting FCC v. Pottsville Broadcasting Co., 309 U.S. 134, 137 (1940)).

[43] Thomas W. Hazlett, "Optimal Abolition of FCC Spectrum Allocation," *Journal of Economic Perspectives* 22 (2008): 103–05.

[44] FCC, "Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues," (OSP Working Paper Series No. 39, May 2003), 11, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-234741A1.pdf.

[45] Faulhaber and Farber, "Spectrum Management," 2002, 5.