

Modernizing U.S. Spectrum Policy

The Committee on Energy and Commerce is issuing a series of white papers as the first step toward modernizing the laws governing the communications and technology sector. The primary body of law regulating this sector was passed in 1934 and has not been substantially updated in 18 years. Changes in technology and the rate at which they are occurring warrant an examination of whether, and how, communications law can be rationalized to address the 21st century communications landscape. For this reason, the committee initiated an examination of the regulation of the communications industry, and seeks comments from all interested parties on the future of the law.

History of Spectrum Allocation, Regulation, and Licensing

Spectrum allocation, regulation, and licensing began well before the Communications Act of 1934 (“the Act”). Prior to 1934, the Radio Act of 1912, which vested licensing authority with the Secretary of Commerce, regulated radio. Passed in the wake of the Titanic disaster, the Radio Act of 1912 sought to regulate wireless communications to prevent interference from stifling the potential uses of radio. Just fifteen years later, Congress passed the Radio Act of 1927, which moved licensing authority from the Secretary of Commerce to the newly created Federal Radio Commission. Finally, in 1934 Congress passed the Act, creating the Federal Communications Commission (FCC), which continues to be the primary regulatory body for spectrum regulation today.

Licensing. Since the 1927 Act, the electromagnetic spectrum has been a public good licensed for private use. However, the mechanisms for licensing and rules that surround use of the license have evolved significantly. Under the 1912 Act any American could apply for a license to use the airwaves and the Secretary of Commerce was compelled to grant a license for use. In the 1927 Act, that all changed, with the Federal Radio Commission empowered to choose among competing applications, and select the one that it deemed most in the “public interest.” While this was one possible way to solve the problem of scarcity, the practical reality of this system was not lost on the newly formed FRC: some applicants would be told by the government, “there is no room for you.”¹

Starting in 1934, the FCC began to use hearings to determine to whom it would license spectrum. For the first 10 years of the FCC, this was a relatively straightforward process, as there were no instances of multiple applications for the same license. However, in 1944 two applicants sought licenses for the same band of spectrum. These mutually exclusive applications led to the Supreme Court case of *Ashbacker Radio Corp. v. FCC*,² which required the FCC to consider mutually exclusive applications in a single comparative hearing, setting the stage for nearly 40 years of what the industry affectionately called “beauty contests.”

Recognizing the shortcomings of the comparative hearing process, in 1982 Congress authorized the FCC to use random selection (lotteries) to resolve mutual exclusivity. While this

¹ Federal Radio Commission, *First Annual Report*, at 6 (1927).

² 326 U.S. 327 (1945).

system had some notable uses in the 1980s,³ lotteries were all but eliminated by Congress in 1997.⁴ While the technology migrated from broadcast radio, to broadcast television, to the earliest mobile phones, the absolute power of the FCC to determine who it thought would put the spectrum to the best use continued unabated until 1993.

In 1993, Congress amended the Communications Act⁵ to create Commercial Mobile Radio Services (CMRS)—what many commonly call cellular or wireless services—and authorized the FCC to conduct auctions for certain spectrum licenses. Following on early auction successes, Congress again responded in the Balanced Budget Act of 1997,⁶ expanding the FCC’s auction authority to cover most types of spectrum licenses.

Finally, in 2012, Title VI of the Middle Class Tax Relief and Job Creation Act (Spectrum Act) expanded the Commission’s spectrum auction authority, authorizing the Commission to conduct voluntary incentive auctions: auctions designed to provide an economic incentive for current licensees to relinquish spectrum in exchange for compensation. The law grants the Commission authority for a one-time, specialized incentive auction in which broadcast television stations may relinquish spectrum for Commission auction, as well as ongoing authority to hold other incentive auctions.

Discussion and Questions

1. As discussed in white paper #1 on Modernizing the Communications Act, the telecommunications industry has experienced a great deal of convergence in recent years. One result is that the current licensing structure at the FCC may no longer be the most efficient or appropriate method to maximize spectrum use. The FCC is responsible for licensing spectrum for a number of services, including public safety, fixed and mobile wireless, broadcast television and radio, and satellite. Although many of the processes are the same among these services, the licensing authority is housed in disparate bureaus. What structural changes, if any, should be made to the FCC to promote efficiency and predictability in spectrum licensing?
2. Spectrum users are allowed to operate without an FCC license—subject to certain technical rules—in spectrum that is designated as “unlicensed.” In 1985, the FCC opened up frequency bands, including the 2.4 GHz band, for unlicensed communications, and has since allocated other bands specifically for unlicensed operators. Users of unlicensed spectrum do not have exclusive use rights and are subject to interference by others. While operators do not need a license, they must abide by other regulatory safeguards, including authorization of equipment, accepting any interference and not causing harmful interference to others, and ceasing operations upon FCC notification.

³ See, e.g. *In re: Selection by Lottery for Competing Cellular Applications*, 98 F.C.C. 2d 175 (1984) (use of lotteries to distribute licenses for the cellular service in markets other than the thirty largest).

⁴ Pub. L. No. 105-33, Title III, 111 Stat. 251 (1997) (Balanced Budget Act of 1997).

⁵ Pub. L. No. 103-66, Title VI, 6002(b), 107 Stat. 312 (1993) (Omnibus Budget Reconciliation Act of 1993 (“OBRA-1993”).

⁶ Balanced Budget Act of 1997.

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?

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 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?
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?
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?
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?

7. Finite supply and ever increasing demand have created the scarcity around which the FCC's regulatory controls are based. The FCC has placed limitations on spectrum holdings in a number of ways. In mobile wireless, the Commission has implemented policies that included the cellular cross-interest rule, the Personal Communications Service (PCS) cross-ownership rule, and the Commercial Mobile Radio Services spectrum cap. Currently, the Commission conducts a case-by-case analysis of spectrum aggregation for each entity. The two-part "spectrum screen" first analyzes changes in market concentration that would result from the proposed transaction, and then examines the amount of spectrum that is suitable and available on a market-by-market basis. Prompted by the passage of the Middle Class Tax Relief and Job Creation Act, the FCC initiated a proceeding to review existing policies regarding mobile spectrum holdings to determine whether they still satisfy the statutory goals of promoting competition and avoiding excessive concentration of licenses, given changes in technology, spectrum availability, and the overall marketplace.

The FCC has considered other tools to try and enhance competition within the wireless services market. Among these are spectrum "set-asides," where blocks of spectrum are reserved for a particular type of bidder; bidding credits, which provide a discount on winning bids to small businesses or to specific groups like women and minorities to encourage bidding; and auction design, including reserve prices, package bidding, and proposed restrictions on bidder eligibility. Given the complexity of spectrum auctions, these policies have been criticized for altering the playing field and distorting outcomes. What principles should Congress and the FCC consider when addressing spectrum aggregation limits? How has the converging marketplace and growing demand for services changed the discussion of spectrum aggregation?

8. The FCC further promotes efficient use of spectrum through the build-out requirements and operating rules attached to licenses. Build-out rules require licensees to construct and activate infrastructure within a certain timeframe, or risk losing that license. The operating rules require some licensees to return a license if not used for any 12-month period after construction, promoting the active and continual use of spectrum. These provisions help to ensure that spectrum that is not fully utilized becomes available to those who will put it to dynamic use. Should the Act promote competitive and efficient use of spectrum in this way? How effective is the current Act in doing so? How effectively has the FCC used the tools at its disposal to encourage competition?
9. As discussed above, interference can pose a major problem to efficient and full use of spectrum by providers. The FCC sets limits on transmissions, but doesn't regulate the receivers used by wireless devices to receive wanted signals and eliminate the noise coming

from the other surrounding spectrum bands. Underperforming receivers can prevent a device from operating properly. While the FCC has used tools like guard bands to mitigate the potential for interference, recent examples of receiver overload have shown that these efforts may not be enough as demand for spectrum increases but resources become more and more constrained. Some have proposed receiver standards as a solution, but others argue that such a step could result in over-engineering and higher consumer prices. What is the best balance between mitigating interference concerns and avoiding limiting flexibility in the future? Can engineering and forward-looking spectrum strategies account for the possibility of unanticipated technologies and uses in adjacent spectrum bands? How do we promote flexibility without unreasonably increasing the cost of services and devices? Does the Act provide the FCC tools to address this problem?

10. The other governing body of domestic spectrum use is the National Telecommunications and Information Administration (NTIA), which has the authority to assign spectrum frequencies to all federal government owned or operated radio stations under section 305 of the Communications Act. NTIA manages the federal government's use of spectrum, in coordination with the FCC. Distinctions between "federal" or "non-federal" bands of spectrum are administrative creations made through agreements between the FCC and NTIA. The Spectrum Act required NTIA to work with the FCC to identify specific bands for release to commercial use and how to repurpose resources from federal to commercial use, with priority given to options that assign spectrum for exclusive, non-federal use through competitive bidding. In a report on reducing duplication in the federal government, GAO identified spectrum management as 'fragmented' between NTIA and the FCC and urged coordination.⁷ What role should NTIA play in the licensing and management of spectrum? Is their current role appropriate and necessary, given the potentially duplicative functions of the FCC and NTIA in spectrum allocation and assignment?

While these questions address specific spectrum issues, the committee will encourage comment on any aspect of spectrum policy. Please respond by April 25, 2014, to commactupdate@mail.house.gov. For additional information, please contact David Redl at (202) 225-2927.

⁷ U.S. Gen. Accounting Office, *GAO-12-342SP: 2012 Annual Report: Opportunities to Reduce Duplications, Overlap and Fragmentation, Achieve Savings, and Enhance Revenue* 89 (2012).