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Battle Over the Airwaves

PRINCIPLES FOR SPECTRUM POLICY REFORM

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This is the first in a series of briefs examining issues related to reforming the management of the public airwaves and summarizes a longer working paper with the same title. To request a copy, please email calabrese@newamerica.net.

Today the American people collectively own the most valuable resource in the emerging information economy: the airwaves, also known as the electromagnetic spectrum. Auctions conducted last year in Europe and early this year in the U.S. suggest that spectrum occupied by commercial licensees has a market value in excess of $300 billion.

While high bids by wireless phone companies should be a boon to the ordinary citizens who own the airwaves, high prices also evidence a policy-induced spectrum shortage that threatens to delay the widespread availability and affordability of wireless broadband services. Americans are prisoners of an outdated industrial policy; we are trapped somewhere between the outmoded central-planning approach that characterized Federal Communications Commission (FCC) policy until the mid-1990s, and a new more flexible and market-based approach that applies only to mobile wireless services. This outdated zoning and giveaway policy has produced the worst possible outcome: a spectrum shortage, no incentives for efficient use, picking "winners" and "losers" among industries, and the forfeiture of tens of billions in public revenue.

The immediate problem for policy makers is the shortage of spectrum caused by the rapid diffusion of wireless communication. The wireless industry estimates it will need to double its share of spectrum in order to make mobile broadband services widely available and affordable over the next five-to-ten years.[1] The potential consumer and commercial value of these "third generation" (3G) wireless applications is enormous.[2] Unless current users give up spectrum, access to a host of high-speed mobile data applications may either be delayed or severely rationed by premium pricing.

The *short-term* issue is how to reallocate spectrum from existing licensees (who pay nothing) to emerging technologies (such as wireless broadband services) that promise both higher value-added services *and* the payment of substantial public revenue. The *longer-term* challenge is to modernize spectrum policy in a way that combines more flexible and market-oriented allocation rules with a level playing field that requires *all* private users to pay a market rate to rent space on the public airwaves. Any reform that adopts a market approach for allocating spectrum (on grounds of efficiency) should likewise ensure (on grounds of equity) that the financial return flows directly to the public and not as a windfall to any incumbent licensee.

A more efficient and equitable national spectrum policy would be consistent with the following four principles:

1. THE AIRWAVES ARE A PUBLIC ASSET OWNED BY ALL AMERICANS

Any spectrum reform must be premised on the government's fiduciary role as manager of this precious public asset. The spectrum, which represents nothing more tangible than the electromagnetic properties of the earth's atmosphere, is managed in every nation as a public resource. The Communications Act of 1934 plainly prohibits private ownership of spectrum and requires licensees to waive any right or claim beyond the specific terms and limited period of the license. The law also authorizes the FCC to allocate frequencies to various services and to grant temporary licenses consistent with the "public interest, convenience, and necessity."

The more fundamental underpinning for common ownership and democratic control of the airwaves is that like the oceans, the atmosphere, and other natural systems, the airwaves are inherently a *common asset*. The Romans called this property *res publicae*, a concept incorporated into English common law and later into 19th century American law as the "public trust doctrine." The U.S. Supreme Court recognized the inalienable public ownership of certain common assets most forcefully in *Illinois Central Railroad v. Illinois*. In that case, the Court revoked an Illinois law transferring ownership of Lake Michigan shoreline to the railroad, holding that although the state held title to the land, it did so merely "in trust for the people of the State."[3] There is a strong case to be made that not even Congress has the authority to "sell off" the public airwaves for all time and that at a minimum, the public is entitled to appropriate direct compensation.[4]

As wireless communication evolves, both First Amendment values and rapid technological change reinforce the concept of the airwaves as an inherently public asset. A number of legal scholars and engineers, for example, argue that new

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technologies – using ultra-wideband transmission and software that allow frequency "hopping" – may soon permit a "spectrum commons," operating on unlicensed spectrum, that is similar in concept to the open-access architecture of the Internet.[5] They argue that if technology undermines the scarcity rationale for exclusive licensing, then more of the airwaves should be opened for shared (unlicensed) use.

Some free market economists argue that establishing permanent private ownership rights in the airwaves could not only cope with the scarcity and interference problems that justify licensing, but could do so far more efficiently.[6] In this view, the economic efficiency of using a price mechanism to allocate spectrum necessitates private ownership (or "propertizing," as one advocate calls it[7]). This view suffers from two fundamental misconceptions.

First, the spectrum is nothing like land or other tangible and irreducibly divisible property. As noted above, recent advances in ultra-wideband and software defined radio technologies suggest we shouldn't presume to know the optimal way to organize future access to the airwaves. The FCC's 50-year-old subdivision scheme based on discrete channels and guard bands may soon prove as inefficient as requiring that land be subdivided using only circular plots. The possibility that technology could radically alter how society might choose to organize the airwaves provides another important reason for maintaining public control without the need to resort to eminent domain proceedings against "private owners" of the airwaves.

Second, while it's true that a price mechanism and private secondary markets for spectrum would provide a more efficient means of allocation than command-and-control regulation, this by no means necessitates private ownership. FCC auctions use a price mechanism to allocate licenses; the problem is rigid regulation that denies users flexibility. Along the continuum between central planning and complete privatization, private rights in spectrum licenses can be defined to allow holders (for the period of the license) to sell, transfer, sublease, aggregate, or change the use of spectrum – a degree of property-like rights not now associated with the "free" (but highly constrained) licenses conferred as an instrument of FCC industrial policy.

A more serious threat to the public's stake in the airwaves is the claim that spectrum licenses acquired at auction since 1994 may be automatically renewed every 10 years in perpetuity at no additional cost to users. While this may serve the government's short-term desire to maximize auction revenue, it has at least two negative consequences. One is that it artificially inflates the cost of spectrum for potential market entrants, favoring big companies and reducing competition. Second, it deprives the general public of future flows of revenue that would almost certainly be greater as the trend toward a wireless world info-structure emerges in the decades to come.
In sum, if there's financial "pie in the sky" – in the form of scarcity rents for spectrum – it belongs equally to all Americans.

2. ALL COMMERCIAL LICENSEES SHOULD PAY FOR USE OF SPECTRUM

Many public assets – from mineral wealth to grazing land – are made available for commerce and generate billions each year in public revenue. Similarly, both efficiency and equity considerations suggest that all commercial licensees should be placed on a level playing field and pay for using the public airwaves.

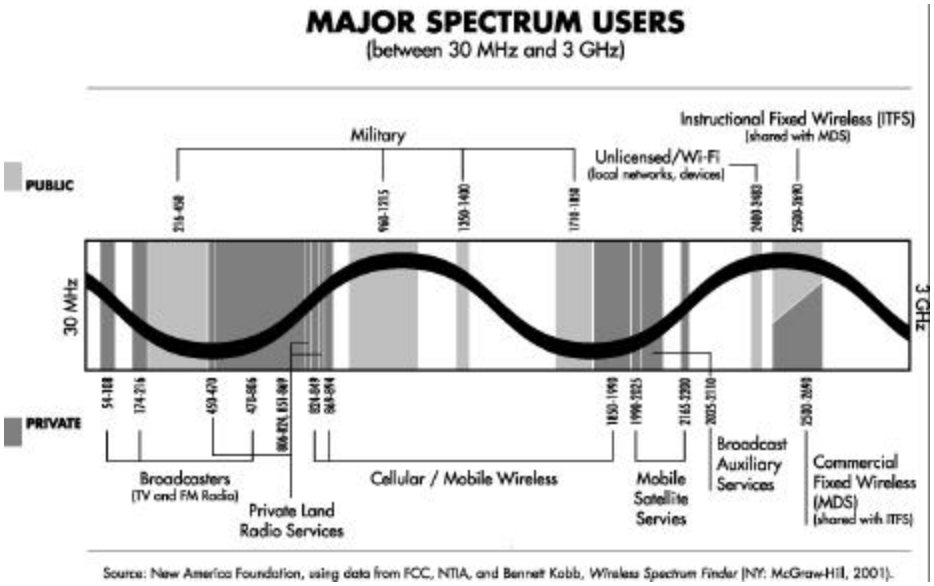
When any input to production is freely available, users have no incentive to use it efficiently. By using auctions or charging rents, the government ensures that scarce frequencies are allocated to firms that value it most highly and that private users have a financial incentive to use the resources efficiently. If forced to pay a market price – and if allowed to sell or sublease licenses – incumbents would have strong incentives to seek the most cost-efficient solution.[8] Some incumbents would choose to invest in more spectrum-efficient equipment, others would substitute wireline or public commercial services, and still others would sell out to new services willing to sublease or buy their license.

Private secondary markets for wireless bandwidth would also result, much like we have today for wireline bandwidth. There would be no "crisis" concerning a shortage of spectrum for advanced wireless services, since any new or expanding competitor could bid needed spectrum away from less valuable services.

Although Congress mandated auctions (the first of which occurred in 1994) as the means to assign new licenses for mobile communication services, it has not given the FCC authority to auction or charge rent for most of the spectrum already occupied by other incumbents. For example, the 1996 Act effectively *doubled* the share of the airwaves held by TV broadcasters – a giveaway then valued by the FCC at $37-to-$70 billion, but now worth far more.

While TV and radio broadcasters occupy the most valuable "beachfront" spectrum, other industries also enjoy rent-free use of the airwaves. Prominent among these are satellite services, the fixed wireless industry ("wireless cable"), and private land mobile services, which are two-way radio services shared by firms in industries such as petroleum, taxicabs, and utilities. The mobile wireless industry is virtually alone in paying to use the public airwaves.

The failure to use a flexible market mechanism to allocate spectrum among competing uses also creates inequities. One is that private companies are not treated equally. While FCC auctions since 1994 have attracted more than $36 billion in bids from wireless phone companies, incumbent industries continue to use the spectrum rent-free.



The greater inequity is that the public is denied a fair return on an asset that any private company would lease at market rates. The financial stakes are enormous. One Wall Street analyst told the National Association of Broadcasters (NAB) Futures Summit in March that the industry's free licenses to the public airwaves are worth more than the stock market value of all U.S. broadcast stations combined. Based on prices paid at the most recent auctions, he estimated that the theoretical market value of spectrum assigned to commercial TV broadcasters is as high as $367 billion.[9]

Two corollary principles, which relate to the dangers of using auctions to raise revenues, should be considered an essential part of a more market-oriented policy that charges all commercial users of spectrum.

First, all frequencies that can be made available for commercial purposes should be auctioned as rapidly as possible. Spectrum should *not* be managed – nor auctions scheduled – to maximize public revenue. Policy makers should use the market and compensate the public – but not manipulate auctions as an instrument of budget policy.

Second, whatever price mechanism is used, it is critical that licenses be issued for a defined period of time and not confer entitlements in perpetuity. As noted, recent auctions of spectrum to wireless phone companies sought to maximize current revenue by giving winning bidders presumptive rights of renewal – and thus implying (though not stating) that no additional rent will be charged, which stands in contrast to European 3G auctions.

3. FLEXIBLE, MARKET ALLOCATION SHOULD REPLACE RIGID SPECTRUM "ZONING"

Since the advent of radio in the mid-1920s, each new use for the airwaves (from FM radio, TV and satellite broadcasting, to private two-way radio services) applies for its own exclusive and highly restrictive allocation. Regulators adopt a "band plan" that allocates spectrum *only* for this discrete purpose, and that often dictates the particular technologies to be used as well as the number of competitors allowed. One result is that the spectrum allocation chart looks like a fossilized record of fading services and technologies. As technologies evolve, incumbent industries find themselves squatting on far more spectrum than they need – and far more than they would ever pay to use – while emerging services must mount an expensive political and regulatory battle to operate at all.

Some regulation is essential in this area. Congress and the FCC need to police interference, coordinate allocations with international bodies, and reserve the ability to reorganize spectrum use if technologies or public needs radically change. Nevertheless, spectrum allocations that appeared to make sense decades ago are now frozen in place. Incumbents holding "free" spectrum face no opportunity costs even when the spectrum could be put to more productive use.

In the mid-1990s, the FCC moved consciously toward a more flexible approach when it auctioned licenses for wireless personal communications services (PCS). And in 1999, after years of rancorous internal debate, the FCC released a statement of guiding principles for its future activities in spectrum management which declared that it would increase flexibility in allocations, promote spectrum efficient technologies, encourage the development of secondary markets for spectrum, and seek ways to make more spectrum available.

However, in contradiction to its own 1999 policy statement, the FCC has continued to shape the use of the airwaves on an exclusive service-by-service basis.[10] Indeed, in July 2001, the FCC appeared to return to an aggressive industrial policy of "corporate welfare" by giving satellite mobile phone providers 70 MHz of free spectrum over the objections of potential competitors among cellular mobile phone companies that paid billions of dollars at auction for their spectrum.[11]

4. SPECTRUM REVENUE SHOULD BE RETURNED DIRECTLY TO THE PUBLIC OR REINVESTED TO BENEFIT ALL AMERICANS

Ideally, revenue from spectrum auctions and rents would be rebated directly back in equal amounts to every American, as the state of Alaska does with public oil royalties, or deposited into universal saving accounts. Unfortunately, spectrum revenue is too irregular and too small relative to the U.S. population to justify the administrative cost.

Alternatively, the revenue could simply be deposited into the general Treasury – which is, in fact, current policy. This is inadequate for two reasons. First, this is inherently regressive, since it offsets income tax liabilities that are based on the ability to pay, rather than benefiting all citizens equally. Second, when our nation monetizes a common asset, it seems sensible to reinvest that windfall in new public assets of broad public benefit. Because each American owns an equal share of the airwaves, we believe a substantial portion should be reinvested in new public assets that update the non-commercial portion of our educational and civic infrastructure for the digital era.

Perhaps the most relevant way to think about reinvesting spectrum revenue is to fulfill the "public interest obligations" that originally justified giving broadcasters free monopoly access to the airwaves. These unmet needs include quality children's and educational programming, local public service media, expanded civic discourse, and free media time for political candidates. Since the high cost of buying access to the airwaves is a leading cause of special interest influence in Congress, advocates of campaign finance reform have proposed charging broadcasters a rental fee for spectrum that would finance a "political broadcast time bank" to purchase media time for candidates and parties who accept strict spending limits.[12]

Another proposal envisions a "Digital Opportunity Trust" dedicated to funding innovative uses of digital technologies for education, lifelong learning, and the transformation of our civic and cultural institutions.[13] For example, while our nation's information highway is nearly paved, there are precious few 'express lanes' (broadband connections) or 'school buses' (innovative content and software) capable of realizing its potential for education, training, and civic discourse. Revenue from upcoming spectrum auctions could be allocated to capitalize the trust fund, yielding a permanent revenue stream for public investments.

Conclusion: Getting from here to there

There is an emerging consensus that spectrum licenses should trade freely and allow users more flexibility, but no consensus on how to get from here to there. The new deregulated licenses would be more valuable, since they would confer property-like rights for the term of the lease. The vexing economic and political problem is: How can the public collect a fair "rent" from incumbent license holders who were given their spectrum for free? Since both a massive giveaway and an immediate free-market auction of incumbent frequencies appear politically impractical, policy makers may need to find a middle-ground solution that minimizes disruption to on-going services during a transition to a market-based rental regime. One proposal, by former FCC General Counsel Henry Geller, would impose a "right of way" fee similar to the 3-to-5 percent of subscriber revenue paid by cable companies to local governments for terrestrial rights of way. Whereas a date to auction incumbent spectrum may need to be set a decade or more in the future, fees can at least recover a share of revenue for the public and internalize incentives for incumbents to use or give up under-utilized spectrum.

The nation needs a new, more coherent national spectrum policy that is premised on the public's inalienable ownership of the airwaves, and that also promotes both efficient allocation and a level playing field between industries and companies seeking to use spectrum. Although this Congress may limit spectrum reform to the urgent task of freeing up frequencies for wireless Internet services, it should at least reinvest a substantial portion of the auction windfall in new public assets that update the non-commercial portion of our educational and civic infrastructure for the digital era. Even better, Congress should grab this opportunity to lay the foundation for a more coherent national spectrum policy. The bottom line is a better return to all citizens for use of this public asset.

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[1] The 2000 World Radio Conference (WRC-2000) adopted ITU Resolution 223, stating that 160 MHz of additional spectrum will be needed in the U.S. to meet projected 3G system requirements in high-traffic areas by 2010.

[2] Council of Economic Advisers, "The Economic Impact of Third-Generation Wireless Technology," *Government Printing Office*, October 2000, citing studies estimating the consumer surplus generated by current cellular services (1G and 2G) was between $50 and $110 billion per year in 1999.

[3] *Illinois Central Railroad v. Illinois*, 146 U.S. 387 (1892). On Roman law and the common law evolution of the public trust doctrine, see Lynda L. Butler, "The Commons Concept: An Historical Concept with Modern Relevance," 23 *William & Mary Law Review* 835 (1982).

[4] See Richard A. Epstein, "The Public Trust Doctrine," 7 *Cato Journal* 411, 419 (1987), who describes the doctrine as the public property analogue of the eminent domain principle, requiring adequate compensation for takings.

[5] Yochai Benkler, "Overcoming Agoraphobia: Building the Commons of the Digitally-Networked Environment," 11 *Harvard Journal of Law & Technology* 287 (Winter 1998). Others predict technology will eliminate spectrum scarcity entirely. See George Gilder, "Auctioning the Airwaves," *Forbes ASAP Supplement* Vol. 153, No. 8, April 11, 1994, pp. 99-112.

[6] See R.H. Coase, "The Federal Communications Commission," 2 *Journal of Law & Economics* 577 (1959) and Thomas W. Hazlett, "The Wireless Craze and the Punchline to Ronald Coase's 'Big Joke'," *Harvard J. Law and Tech*, Spring 2001. http://www.aei.org/scholars/hazlett.htm.

[7] Lawrence J. White, "'Propertizing' the Electromagnetic Spectrum: Why It's Important and How to Begin," Progress & Freedom Foundation Conference on Communications Deregulation, December 2000.

[8] This rationale underlies the U.K.'s Wireless Telegraphy Act of 1998. See David Hendon, Chief Executive, UK Radiocommunications Agency, "The Challenges of Dynamic Radio Spectrum Management," National Telecom Agency of Denmark Anniversary Conference, February 2001. http://www.tst.dk/dk/publikationer/ jubileumsskrift/kap05.htm.

[9] Tom Wolzien, "Whose Bandwidth is it Anyway?" *National Association of Broadcasters Futures Summit*, Bernstein Research, April 2001.

[10] FCC 99-354, "In the Matter of Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium" (November 22, 1999).

[11] On July 17, 2001, the FCC authorized eight mobile satellite service systems in the 2 GHz band; see FCC DA 01-1631 through 01-1638.

[12] Norman Ornstein of the American Enterprise Institute, and Paul Taylor of Americans for Better Campaigns, advocate this type of reform.

[13] Newton Minow and Lawrence Grossman, *Digital Promise* (New York, NY: Century Foundation Press, 2001).