Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	**)**	
	)	
Spectrum Policy Task Force	**)**	**DA 02-1311**
Seeks Public Comment on Issues	**)**	**ET Docket No. 02-135**
Related to Commission's	**)**	
Spectrum Policies	**)**	

To: OET

COMMENTS OF

THE NEW AMERICA FOUNDATION,
THE CONSUMER FEDERATION OF AMERICA, CONSUMERS UNION,
THE ASSOCIATION OF INDEPENDENT VIDEO AND FILMMAKERS,
THE NATIONAL ALLIANCE FOR MEDIA ARTS AND CULTURE,
THE BENTON FOUNDATION, THE CENTER FOR DIGITAL DEMOCRACY,
UNITED CHURCH OF CHRIST, OFFICE OF COMMUNICATION, INC.,
AND THE MEDIA ACCESS PROJECT

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July 8, 2002

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The New America Foundation (NAF),[1] Consumer Federation of America (CFA),[2] Consumers Union (CU),[3] the Association of Independent Video and Filmmakers (AIVF),[4] the National Alliance for Media Arts and Culture (NAMAC),[5] the Benton Foundation,[6] the United

[1] NAF is a nonpartisan, non-profit public policy institute based in Washington, D.C., which, through its Public Assets Program, studies and advocates reforms to improve our nation's management of publicly-owned assets, particularly the electromagnetic spectrum

[2] CFA is the nation's largest consumer advocacy group, composed of two hundred and eighty state and local affiliates representing consumer, senior, citizen, low-income, labor, farm, public power and cooperative organizations, with more than fifty million individual members.

[3] CU, publisher of Consumer Reports, is an independent, nonprofit testing and information organization serving only consumers.

[4] AIVF is a 25-year-old professional organization serving international film- and videomakers from documentarians and experimental artists to makers of narrative features. AIVF represents a national membership of 5,000, of whom 4,000 are active independent producers. AIVF provides services to the field including: informative seminars and networking events, trade discounts and group insurance plans, advocacy for media arts issues, a public resource library, advice and referral support, and publication of books and directories.

[5] NAMAC is a nonprofit association composed of diverse member organizations who are dedicated to encouraging film, video, audio and online/multimedia arts, and to promoting the cultural contributions of individual media artists. NAMAC's regional and national members collectively provide a wide range of support services for independent media, including media education, production, exhibition, distribution, collection building, preservation, criticism and advocacy. NAMAC's member organizations include media arts centers, production facilities, university-based programs, museums, film festivals, media distributors, film archives, multimedia developers, community access TV stations and individuals working in the field. Combined, the membership of these organizations totals around 400,000 artists and other media professionals.

[6] Based in Washington DC, the Benton Foundation's mission is to articulate a public interest vision for the digital age and to demonstrate the value of communications for solving social problems (www.benton.org).

Church of Christ, Office of Communication, Inc. (UCC),[7] the Center for Digital Democracy,[8] and the Media Access Project (MAP)[9] (collectively, "NAF, *et al*." or "Commentors") respectfully file the following comments in the above captioned proceeding.

INTRODUCTION

An Observation and Three Introductory Qualifications

The debate over spectrum policy is inherently political, since billions of dollars in economic value are at stake. That makes it all the more startling that the Commission's *Public Notice* soliciting public comment does not allude to the relationship of spectrum policy to the core public interest objective of assuring that American citizens can engage in democratic self-governance.

Because of their concern that FCC policy must promote First Amendment values, Commentors stress three important qualifications to the suggestions set forth below.

First, these recommendations are presented as a ***unified whole***. Commentors' support of immediate auctions of more flexible and market-oriented licenses for commercial users of spectrum hinges on the Commission's active involvement in assuring that the other public interest goals of the Communications Act and Constitution are being met, and on absolute opposition to the creation of property rights in spectrum. ***Before*** the Commission can redefine licenses to increase flexibility, or rush to auction more spectrum, it must establish limited and

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[7] UCC is a non-profit corporation, charged by the Church's Executive Council to conduct a ministry in media advocacy to ensure that historically marginalized communities (women, people of color, low income groups, and linguistic minorities) have access to the public airwaves. The United Church of Christ has 1.4 million members and nearly 6,000 congregations. It has congregations in every state and in Puerto Rico.

[8] The Center for Digital Democracy is a nonprofit public interest organization committed to preserving the openness and diversity of the Internet in the broadband era, and to realizing the full potential of digital communications through the development and encouragement of noncommercial, public interest content and services.

[9] MAP is a 30 year-old non-profit, public interest telecommunications law firm which represents civil rights, civil liberties, consumer, religious and other citizens groups before the FCC, other federal agencies and the Courts.

relatively short initial license terms with clear reversion of rights and no grant of indefinite property interests.

Second, the Commission should significantly increase the quantum of spectrum available for non-commercial use and for unlicensed use as a "spectrum commons." Commentors do not subscribe to the theory that economic efficiency represents the predominant public interest for which the Commission must strive, much less that efficiency is synonymous with the public interest, or that the permanent grant of exclusionary private licenses in spectrum maximizes the potential economic gain to society. To the contrary, because the market will ***not*** adequately support mechanisms for controversial speech, non-mainstream perspectives, and innovative services to unprofitable or unproven markets, the Commission must continue to allocate spectrum as may be necessary to provide a platform for non-commercial speech, civic discourse and innovation.

Finally, Commentors recognize that such reservations for non-commercial speech and other important policy interests will sometimes require departure from the general scheme of market-oriented and flexible allocation policies enumerated in these comments. Homeland security, the national commitment to a broadcasting system based on localism, the need to ensure universal access and deployment to rural and low income areas, and issues pertaining to public safety or public health (such as wireless medical devices) will inevitably necessitate the creation of narrow exceptions to the market-oriented policies urged below. Such exceptions, however, must remain narrow. They should not become loopholes which enable incumbents to exclude competitors or create artificial scarcity.

SUMMARY

Commentors propose four principles to guide the task force in formulating its recommendations:

1. The Commission must manage the airwaves as a public asset owned collectively by all Americans;

2. Replacing spectrum "zoning" with a more, flexible, market-based allocation system will enhance spectral efficiency and consumer welfare;

3. To recoup more effectively the value of the use of spectrum for the public and to provide incentives for deployment and innovation, commercial licensees should pay regular license fees rather than a single lump-sum that conveys property-like rights; and,

4. The Commission should expand the spectrum available for unlicensed "commons," and continue to allocate licensed spectrum exclusively for noncommercial uses as needed.

In addition, Commentors urge the task force to recommend that the Commission call upon Congress to earmark auction revenues for new public investments that benefit all Americans.[10] Indeed, Representative Ed Markey (D-MA) and Senators Christopher Dodd (D-CT) and James Jeffords (I-VT) have introduced legislation that embodies this concept. The Commission should explicitly endorse this approach.

Commentors welcome the Commission's decision to reexamine its spectrum policy, albeit with some concern that the full Commission should conduct this review.[11] Citizens and the economy will benefit enormously from replacing the outdated zoning-and-giveaway policy that has characterized spectrum allocation policy from the 1920s to the present. This system, formulated during the infancy of wireless technology, has produced the worst possible outcomes:

[10] The Communications Act specifically requires that the Commission must remit auction revenues to the general Treasury. 47 USC §309(j)(8)(A).

[11] See Statement of Commissioners Kevin J. Martin & Michael Copps On the Spectrum Policy Task Force's Public

an artificial spectrum shortage, no incentives for efficient use, little flexibility for new services and competition, government picking and protecting "winners" and "losers" among industries, the forfeiture of tens of billions of dollars in public revenue, and an inadequate "commons" for citizen communication.

At the same time, however, the Commission must not fall into the trap of enshrining current uses and incumbents through "propertizing" the spectrum. As an initial matter, the Communications Act expressly prohibit any property interest in a license, *see* 47 USC §301, 304, 309(h), and prohibits alienation of such licenses without an affirmative, particularized finding by the Commission that the specific license transfer in question serves the public interest. 47 USC §310(d).[12]

Even if the Act did not prohibit conferring a property interest in a license, granting a licensee a perpetual monopoly on the right to transmit at a specific frequency, subject only to the conscience and innovation of the licensee, is bad policy. Such a policy will stifle innovation and free expression, diminishing value inherent in the spectrum while permitting incumbents to suppress any technology that threatens to disrupt their established business models. The Commission should not sell the future to those who can muster the billions of dollars to win a spectrum auction today.

In contrast to the public trustee model that now governs licensing, the concept of spectrum "flexibility" and secondary markets for wireless bandwidth appears to contemplate a future in which commercial spectrum is treated more like a commodity; for the limited period of the license, commercial licensees could potentially sell, sublease or completely change their use of spectrum without FCC approval, subject primarily to very general rules concerning harmful

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Notice on Spectrum Policies, ET Docket No. 02-135 (Rel. June 6, 2002).

interference. The issuance or modification of a license that grants new, valuable and "flexible" rights to private parties is the equivalent of a new license. All of the policy rationales that support the competitive assignment of new license rights, currently required by law, appear to apply equally to the assignment of licenses with enhanced flexibility.

The Commission must do more than simply define and grant new and far more valuable "flexible" licenses to incumbents, or establish an auction process that unduly favors incumbents over their private sector competitors. Absent safeguards, this would unlawfully and unjustly enrich incumbents and deprive "the public of a portion of the value of the public spectrum resource made available for commercial use." 47 USC §309(j)(3)(C). Congress clearly intended that auctions be used not only as a tool for efficient initial assignment of licenses, but also as a means of avoiding windfalls and capturing for the public a fair return on the rental value of this scarce public asset.

Rather, Commenters believe that in shifting to a system that provides licensees greater flexibility, it is essential that the Commission specify carefully defined, limited and relatively short license terms. This will have the beneficial effects of allowing the public to retain greater control of the spectrum through consistent re-evaluation, and will also allow the public to recoup the value of the spectrum more efficiently. Smaller entrants will not be barred by the need for billion dollar up-front payments, and incumbents will not be able to entrench themselves to the detriment of innovators.

Commentors wish to emphasize that, regardless of the method used for initial assignment of these newly defined rights, auctions should be combined with ongoing lease fees that would attach after the initial license period (*e.g.*, after 10 years), and only if the incumbent opts for

[12] See also *In re Nextwave Personal Communications Inc.*, 200 F.3d 43 (2nd Cir. 1999).

renewal. (Alternatively the incumbent can return the license for re-auction). These ongoing lease fees serve several objectives: first, to provide the public with an ongoing and market-rate return on the public asset; second, to reduce the up-front auction cost of the new rights (since bidders would not be anticipating permanent, cost-free control); and third, to encourage capital investment by giving the new incumbents an option to convert after the initial period to a leasing arrangement with expectation of renewal. Although the lease fees would need to be initially defined by Congress and administered by the Commission, they should be modest and market-based. Once the new flexible, market-based allocation system is in place, for example, lease fees could be imputed based on secondary market transactions for spectrum with similar propagation characteristics. Commentors recognize that licensees must hold a license long enough to bring new services to market, recoup development and deployment cost, and recover a profit sufficient to incent businesses to innovate in the first place. Arriving at the proper balance between these policy goals and interests will be a difficult, but attainable goal.

Commentors note that as a Constitutional matter, the Commission cannot abandon the public's "paramount" right to access to information via the airwaves. *Red Lion Broadcasting Co., Inc. v. FCC*, 395 U.S. 367, 390 (1969). As the Supreme Court has explained, in the current system of government-granted monopolies on broadcasting, the holder of the license has no more "right" to it than the competing applicant the FCC denied or the competing bidder who cannot afford to pay more. *Id*. at 388-90. But the public retains "their collective right to have the medium function consistently with the ends and purposes of the First Amendment." *Id.* at 390.

The First Amendment and the Communications Act thus mandate that the Commission maintain its supervisory role in creating trusteeships for use of the public airwaves. This does

not, however, require the Commission to rely on the grant of exclusive licenses. To the contrary, technology continues to emerge that facilitates the dynamic sharing of the spectrum by all, potentially eliminating "scarcity" and the need for any licensing, an approach generally known as "open spectrum." Much as the Amateur Radio Service has long operated as a "commons," a meshed network of smart devices has the potential both to promote democratic communication and to mitigate (or even eliminate) spectrum scarcity through a "spectrum commons" operating on unlicensed spectrum. Leading engineers and entrepreneurs are already developing and deploying wireless communications networks, based on *ad hoc*, meshed architectures and Internet-like design principles, that are potentially far more extensive and spectrum efficient than today's WiFi systems.[13]

Arguably, with the emergence of such technology, the Constitution mandates transition from the existing scheme of exclusive government monopolies to one in which every citizen will someday enjoy the right to communicate freely over the public airwaves. *City of Los Angeles v. Preferred Communications*, 476 U.S. 488 (1986); *FCC v. League of Women's Voters*, 468 U.S. 364, 376 n.11 (1984). Granting property rights in spectrum would re-enforce the resistance of incumbents and complicate any such transition. Indeed, the resistance to even limited expansion of the unlicensed use of spectrum by incumbents with limited licenses,[14] demonstrates the danger of creating a class of permanent licensees wedded to particular allocations and uses, but without the restraining influences currently imposed by license terms. The Commission must not grant property rights in licensed spectrum because future technology may render such rights obsolete.

[13] "WiFi" describes systems employing the 802.11 wireless protocols developed by the Institute of Electrical and Electronic Engineers ("IEEE"). *See supra n.* 50.

[14] *See In re Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, ET Docket No. 98-153 (Released April 22, 2002), Statement of Commissioner Martin ("Sharing decisions are made particularly difficult in the context of the "fiefdom" mentality that seems to characterize players who fervently guard their spectrum "turf," regardless of whether additional use can be accommodated. Unfortunately, the result is often

In short, while technologies to eliminate spectrum scarcity entirely and create a true spectrum commons hold much promise, they remain in their infancy. They may not come to fruition for years, if at all. The Communications Act and the Constitution require the Commission to supervise public trustees granted exclusionary licenses to use this unique public resource. Thus, while increasing the ability of the public to make unlicensed use of the spectrum, the Commission must ensure that the existing licensees continue to serve the public interest.

The Commission should continue to authorize greater numbers of unlicensed uses. *See, e.g., In re Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems,* ET Docket No. 98-153 (Released April 22, 2002). The Commission should adopt a presumption that increasing unlicensed uses serves the public interest, subject to the limitations imposed by the existing state of technology. Where incumbents or others challenge applications for new, unlicensed uses, the Commission should require those opposing the applications to demonstrate through rigorous scientific studies that a real danger of harmful interference exists. Furthermore, the FCC should encourage spectrum sharing and other innovations that increase the number of users and the availability of uses. *See, e.g., In re Amendments of Part 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems on Ku Band Frequency Range*, ET Docket No. 98-206 (Released May 23, 2002) ("*Ku Band Sharing Order*"); *In Re Creation of a Low Power Radio Service*, 15 FCC Rcd 2205 (2000). Finally, the Commission should continue its policy of reserving spectrum for noncommercial uses.

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unrealized potential that can never be recaptured").

ARGUMENT

I. THE COMMUNICATIONS ACT AND THE CONSTITUTION REQUIRE THE COMMISSION TO MANAGE SPECTRUM AS A PUBLIC TRUST.

Any spectrum reform must be premised on maintaining the government's role as manager of this commonly owned natural system. Shortly after commercial radio broadcasting began, Congress codified public ownership of the airwaves in the Radio Act of 1927, using language carried forward into the Communications Act of 1934, the law that regulates telecommunications today. Section 301 of the Act explicitly states that:

> It is the ***purpose of this Act to maintain the control of the United States over all the channels of radio transmission***; and to provide for the use of such channels, but not the ownership thereof, by persons for limited periods of time, under licenses granted by Federal authority, and ***no such license shall be construed to create any right, beyond the terms, conditions and period of the license***.

47 USC 301 (emphasis added).

Section 304 of the Communications Act reads:

> No station license shall be granted by the Commission until the applicant therefore shall have waived 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 use of the same, whether by license or otherwise.[15]

47 USC §304.

Indeed, the Commission complies with this statute by recapitulating this exact language

[15] This principle is so fundamental that even prior to the Radio Act of 1927, President Coolidge signed into law a joint resolution of Congress with a nearly identical provision. *See* Senate Joint Resolution 125, 69th Cong. 1st Session, signed into law December 8, 1926. The legislative history of the Radio Act repeatedly refers to "public ownership of the ether," 68 CONG. REC. 2573 (1927), and recognizes that "ether is the inalienable possession of the people," 68 CONG. REC.2872 (1927). See also Thomas W. Hazlett, "The Wireless Craze, The Unlimited Bandwidth Myth, The Spectrum Auction Faux Pas, and the Punchline to Ronald Coase's 'Big Joke'," *Harvard Journal of Law and Technology* (Spring 2001, forthcoming) (http://www.aei.org/scholars/hazlett.htm), at 88-106, for useful historical references. Hazlett notes that the Radio Act's lead sponsor, Senator Clarence Dill, stated later in his treatise *Radio Law* that "[t]he purpose of Congress from the beginning of consideration of legislation concerning broadcasting was to prevent private ownership of wave lengths or vested rights of any kind in the use of radio transmitting apparatus."

on every license and requiring every holder of a license to sign an express waiver of "any claim . . . as against the regulatory power of the United States."

The law authorizes the FCC to allocate frequencies to various services and to grant licenses only "for limited periods of time" consistent with the "public interest, convenience, and necessity." Under the Act's "public trustee" model, for example, the exclusive (and free) access of broadcasters to the airwaves has always been conditioned on certain public interest obligations. The Supreme Court explicitly recognized this principle in *FCC v. Sanders Bros. Radio Station*,[16] holding that the Commission could not consider the economic impact on an existing licensee in its determination of whether to award a new license because "[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***."[17]

Recently the Second Circuit reaffirmed the principle that no property interest attaches to a license to use the spectrum in *NextWave Personal Communications v. FCC*.[18] The court explained that "[a] license does not convey a property right; it merely permits the licensee to use the portion of the spectrum covered by the license in accordance with its terms . . . . Licenses are revocable by the FCC, and the FCC can impose conditions upon them in the name of the public good."[19]

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[16] 309 U.S. 470, 475 (1940).
[17] 309 U.S. at 475 (emphasis added). *See also Red Lion Broadcasting Co. V. FCC*, 395 U.S. 367, 393 ("[l]icenses to broadcast do not confer ownership of designated frequencies, but only the temporary privilege of using them").
[18] 200 F.3d 43, 51 (2nd Cir. 1999).
[19] *Id.*

The Public Trust Doctrine

The more fundamental underpinning for common ownership and democratic control of the airwaves is that like other natural systems – including the oceans, navigable waterways and the atmosphere – spectrum is inherently a *common asset*. There is a strong case to be made that not even Congress has the authority to "sell off" the public airwaves for all time. Throughout history, both law and tradition have recognized that certain assets are inherently public and not subject to ownership – not by private parties, or even by the state. The classic examples from Roman law were roads, harbors, ports and navigable waterways. The Romans called this third category of property *res publicae*, a concept incorporated into English common law and later into 19th century American law as the "public trust doctrine." The doctrine holds that, because of their unique characteristics, certain natural resources and systems are held in trust by the sovereign on behalf of all citizens.[20]

In U.S. jurisprudence, the U.S. Supreme Court recognized the inalienable public ownership of certain common assets most forcefully in *Illinois Central Railroad v. Illinois*.[21] 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 held it merely "in trust for the people of the State."

At a minimum, the citizenry is entitled to just monetary compensation when a public asset is given over to private use. As Professor Richard Epstein eloquently explained in an essay

[20] *See* Gerald Torres, "Who Owns the Sky?" 18 *Pace Environmental L. Rev.* 227 (2001) for an excellent overview of the legal status of common assets and the application of the public trust doctrine to federal management of the atmosphere and emissions trading. 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), and Carol M. Rose, "Roman Roads and Roman Creators: Traditions of Public Property in the Information Age," Paper presented at Conference on the Public Domain, Duke Law School (Nov. 10, 2001) (http://www.law.Duke.edu/pd/papers.html).

[21] *Illinois Central Railroad v. Illinois*, 146 U.S. 387 (1892).

in the *Cato Journal*, the public trust doctrine is analogous to the Fifth Amendment's takings clause; it requires public officials to seek fair compensation for the public when a common asset is transferred to private use:

> The problem of disposing of public property thus raises the mirror image of public use and just compensation questions under the takings clause of the Fifth Amendment. . . . 'No *public* property may be transferred to *private use*, without just compensation,' payable to the public at large.'[22]

The Public's Additional First Amendment Interests

While Congress expressly justified regulating the airwaves largely on practical grounds – that is, the grant of exclusive licenses to avoid interference – the Commission and the courts always considered the public trustee model vital to protecting the public's First Amendment interests. *National Broadcasting Co. v. United States*, 319 U.S. 190, 226 (1943). This principle found its clearest expression in the landmark case *Red Lion Broadcasting v. FCC*, 395 U.S. 367 (1969). There, a unanimous court stated that "[l]icenses to broadcast do not confer ownership of designated frequencies, but only the temporary privilege of using them. . . . [t]he people as a whole retain . . their collective right to have the medium function consistently with the ends and purposes of the First Amendment." *Id.* at 393.[23]

As discussed at greater length in Part II below, advances in wireless technology reinforce the importance of managing the airwaves as an inherently public asset. A number of legal scholars, engineers and entrepreneurs assert that new technologies – using ultra-wideband transmissions and software that allows frequency "hopping" – will soon permit a "spectrum

[22] Richard A. Epstein, "The Public Trust Doctrine," 7 *Cato Journal* 411, 419 (1987) (Epstein's emphasis). For a more general description of the public trust doctrine in U.S. law, see Joseph L. Sax, "The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention, 68 Mich. L. Rev. 471 (1970).

[23] *See also FCC v. Sanders Bros. Radio Station*, 309 U.S. 470, 475 (1940) ("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").

commons" similar in concept to the open-access architecture of the Internet.[24] End users will be able to communicate directly, or via the Internet, without the need for an intervening commercial service to route their transmissions. As more direct and citizen-controlled communications becomes feasible, they argue, the government should make larger portions of the spectrum available for "unlicensed" use based on harmonizing equipment standards and etiquette protocols among hardware and software makers.

In this world of the "spectrum commons," the FCC would still manage the spectrum as a public asset for the benefit of all. It would set necessary rules to facilitate use of the spectrum by all, much as local governments set speed limits and other necessary "rules of the road" to facilitate private as well as public transportation. The need to make additional allocations of unlicensed spectrum and to otherwise facilitate the development of an efficient and democratic spectrum "commons" is discussed at greater length in Part II below.

A. THE COMMISSION CAN MANAGE THE SPECTRUM DIRECTLY THROUGH THE "SPECTRUM COMMONS" MODEL, OR APPOINT TRUSTEES VIA TRADITIONAL ALLOCATION METHODS SUCH AS AUCTIONS, BUT MAY NOT PRIVATIZE THE PUBLIC SPECTRUM OR CONFER WINDFALLS ON INCUMBENT LICENSEES.

Question 2 in the *Notice* requests comment on whether and how licensees should be granted greater "flexibility." Based on the "two models" described by the Task Force in the preamble to the question,[25] presumably the "flexibility" that would be granted in these new

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[24] *See* Yochai Benkler, "Overcoming Agoraphobia: Building the Commons of the Digitally-Networked Environment," 11 *Harvard Journal of Law & Technology* 287 (Winter 1998). *See also* Yochai Benkler, "The Commons as a Neglected Factor of Information Policy," *Telecommunications Policy Research Conference* (September 1998) (http:// www.law.nyu.edu/benklery/commons.pdf).

[25] In its request for comments, the Task Force notes that the Commission has generally embraced two models for transitioning to a more flexible and market-oriented spectrum allocation policy, stating:

> Under one model, the Commission has granted existing licensees additional flexibility so that incumbents can migrate spectrum to its highest value use. A second model has involved the Commission reallocating bands for flexible use with geographic service areas and auctioning "overlay" licenses and unassigned

licenses would both allow licensees far greater discretion to decide what service is to be provided on a band and also give licensees unprecedented discretion as well to sell, sublease, aggregate or disaggregate licenses in ways that currently require advance approval by the Commission. Licenses that added these grants of flexibility would represent a fairly radical and generally welcome change from the Commission's traditional policy of rigidly zoning the spectrum by service and prescribing service rules – both of which become outdated as technology and market demand changes over the years. Indeed, the Commission has generally accorded new licenses auctioned since 1993 a great deal of flexibility and, in addition, has even relaxed service rules on legacy grants of spectrum for analog cellular communication so that those firms could upgrade service to a more efficient digital service.

While these trends are positive and in accord with the Communications Act, there is a point at which the redefinition of a license becomes equivalent to assigning a new license. If these new licenses can be used for categories of service anticipated for assignment by auction under Section 309(j) of the Act, which includes commercial mobile radio services (CMRS) among others, then the Commission should use its authority to ensure: (a) that these new "flexible" license rights are assigned to firms on a competitive basis, making it more likely they will be put to a high-value use; and (b) the "recovery for the public of a portion of the value of the public spectrum resource made available for commercial use," thereby avoiding the "unjust enrichment" of incumbent licensees, as required by law.[26] As noted below, there exist both auction methods and means of collecting lease fees from these new "flexible" licensees in the

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"white space" spectrum to new and existing licensees. This approach may also include rules to require or facilitate band-clearing negotiations between new licensees and incumbents.

[26] 47 U.S.C. § 309(j)(3)(C).

future that can achieve these dual statutory goals of efficiency and equity.[27]

1. A substantial grant of "flexibility" is equivalent to assigning a new license.

It is important to remember that with the arguable exception of bands auctioned for CMRS after 1993, incumbent commercial licensees typically possess a limited-term license to operate a particular service by transmitting over a particular range of frequencies, subject to certain service and operating rules. The public trustee model was premised on the notion that because only a limited number providers would be licensed to transmit a particular service (*e.g.*, television broadcasting), the license must be conditioned on certain public interest obligations, which in theory ensured the public a return on commercial use of scarce spectrum. The concepts of spectrum "flexibility" and secondary markets for wireless bandwidth, in contrast, contemplate a future where commercial spectrum is treated more like a commodity; for the limited period of the license, commercial licensees could potentially sell, sublease or completely change their use of spectrum without seeking FCC approval, subject primarily to very general rules concerning harmful interference.[28]

The issuance or modification of a license that grants such new, valuable and "flexible" rights to private parties is the equivalent of a new license. This is most obviously the case concerning "site" licenses (*e.g.*, broadcasting, private land mobile), since the license concerns the operation of particular equipment at a particular frequency for a particular purpose – whereas a geographic area license to operate any service, whether or not the incumbent site licensee is temporarily protected from harmful interference, is an entirely different (and more valuable) type

[27] Of course, Congress may well decide that it prefers to transfer additional valuable rights to spectrum incumbents – or perhaps to continue requiring some firms to pay for access to spectrum (e.g., wireless personal communication services) while subsidizing other firms (e.g., broadcasters) with free spectrum – but that is a decision best left to Congress and not abrogated by the FCC.

[28] This does not negate the licensee's status as a trustee for the public. Rather, it reflects the evolution in understanding as to how the public interest may best be served, informed by the 70 years of history and the

of license. Even assuming that incumbent licensees have developed a reasonable expectation of license renewal, which arguably promotes certainty concerning sunk capital costs related to the service they are licensed to provide, incumbents certainly have no reasonable expectation of preferential treatment when new, more flexible licenses are granted. As noted below, the capital investments made by incumbent licensees can be protected without conferring windfall profits.

2. Efficient assignment of a new commercial license must generally be by auction.

The Balanced Budget Act of 1997[29] amended Section 309(j) of the Communications Act to expand and broaden the FCC's auction authority. Whereas previous statutes gave the FCC the authority to use auctions as a tool for efficient license assignment, the Balanced Budget Act *requires* the FCC to use auctions to award mutually exclusive applications for most types of spectrum licenses for commercial services.[30] The only notable exception for commercial users is the "digital television service given to existing terrestrial broadcast licensees to replace their analog television service licenses," presumably since the grant of a second channel to incumbent broadcasters in the 1996 Act anticipated a one-for-one exchange of digital for analog channels; the public would eventually receive the revenues after the digital transition period, when the broadcasters would discontinue use of one channel and return it for auction.

Task Force question 2(a) asks whether incumbent users should be given flexibility within their existing spectrum. The answer to this question must depend on whether the Commission – on a band-by-band basis – is merely modifying or relaxing service rules, or whether it is in fact redefining the allocation to allow a substantially different service on the band. An example of

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continued evolution of technology.

[29] Codified at 47 USC §§153 nt; 254 nt; 309 nt; & 925 nt.

[30] Exempted from auctions are licenses or site permits for: "public safety radio services;" "digital television service given to existing terrestrial broadcast licensees to replace their analog television service licenses"; and "noncommercial educational broadcast stations and public broadcast stations."

the former would be a decision to allow a service to adopt digital technology even if the existing service rules contemplated an analog service. An example of the latter would be allowing a band assigned on the condition of its use for one type of service (*e.g.*, broadcasting) to be used for any CMRS service. If the Commission reaches the decision that the "public interest, convenience and necessity" supports opening a band to an entirely new service – by granting "flexibility" within that band – then, whether or not discretion to define that service is delegated to the licensee, there appears to be no statutory or policy reason why that redefined and far more valuable license would not be opened to competitive bidding. *See, e.g., Ku Band Sharing Order* at ¶ 241 (finding that Commission should auction new service license).[31]

All of the policy rationales for competitive assignment of new license rights appear to apply equally to the assignment of licenses with enhanced flexibility. While any commercial incumbent would happily accept a free grant of flexibility, only a competitive process is fair to competing firms and can ensure that this important resource is put its highest value use (or at least its highest value use as judged by private markets).[32] Even the possibility that the Commission would depart from the statutory framework of competitive assignment would both damage the value of spectrum won by incumbents at auction in recent years, and increase the incentives of all incumbent holders to resist returning spectrum they may not be using, or using inefficiently. Moreover, if more flexible, geographic area licenses have a higher market value,

[31] Although Commentors support this approach as a general rule, the specific factual situation surrounding the application of Northpoint/Broadwave warrant a different result, and Commentors do not endorse the Commission's conclusion in *Ku Band sharing Order* as applied to Northpoint/Broadwave.

[32] NAF, *et al.* emphasize that the argument advanced here is not relevant to non-commercial allocations, except perhaps where Congress identifies a need to select among competing providers. Non-commercial providers are generally exempted from the competitive assignment rules for good reason. For example, since the Public Broadcasting System is structured by Congress to offer a non-commercial broadcasting service in each community, it would be contrary to current policy goals to either grant PBS full flexibility or to require PBS stations to drain their limited budgets competing with commercial providers to maintain adequate spectrum space.

then this scarcity rent should not simply be transferred as a gift to firms that happen to have acquired the license with entirely different expectations; it would be more equitable to both competing firms and the public to give all potential users an opportunity to bid and in the process share a portion of the scarcity rent with the public.

3. The Communications Act requires the "avoidance of unjust enrichment"

The enumerated objectives of spectrum auction policy specified by Congress in the 1996 Telecommunications Act include:

> recovery for the public of a portion of the value of the public spectrum resource made available for commercial use **and avoidance of unjust enrichment** through the methods employed to award uses of that resource.[33]

As Commentors have noted, a new type of license defined to allow holders (for the limited period of the license) greater flexibility to transfer, sublease, or change the services offered on the band amounts to a new assignment of a license. Further, with few exceptions the Commission is required to make such new assignment available to competing potential users through a competitive bidding process. If the Commission simply defines and grants these new and far more valuable "flexible" licenses to incumbents – or even sets up an auction process that unduly favors incumbents over their private sector competitors – this would constitute "unjust enrichment" in addition to depriving "the public of a portion of the value of the public spectrum resource made available for commercial use." Congress clearly intended that auctions be used not only as a tool for efficient initial assignment of licenses, but also as a means of avoiding windfalls and capturing for the public a fair return on the rental value of this scarce public asset.

A separate issue with respect to depriving the public of a fair return and avoiding the unjust enrichment of incumbents concerns the auction of "overlay" licenses prior to the

[33] 47 U.S.C. § 309(j)(3)(C) (emphasis added).

expiration of an incumbent's current license. Question 2c. in the Notice asks whether spectrum not currently assigned by geographic areas should be re-assigned by Commission-defined "overlays" or by other means. And in the preamble to the first set of questions the Task Force notes that one model the Commission has recently used when auctioning "overlay" licenses is "to require or facilitate band-clearing negotiations between new licensees and incumbents." The FCC's most recent and significant attempt to "facilitate band-clearing negotiations" – the Order announced last September 17 with regard to clearing TV Channels 60-69 in the upper 700 MHz band – offers a cautionary tale about how this particular model operates in a statutory gray area that can exceed the Commission's authority and trample Congressional intent.

Commentors do not need to rehash here the flaws inherent in this approach, as they are documented elsewhere.[34] Congress has already enacted a law to cancel the auctions based on that Order, signed by President Bush, in part because – as President Bush's proposed budget for fiscal 2003 indicates – the particular band-clearing model proposed by the Commission would have deprived the Treasury of an estimated $20 billion, most of which would have unjustly enriched small broadcasting stations not even using the second channel granted for digital television. Indeed, the Chairman of the Senate Commerce Committee, Sen. Ernest Hollings, called the band-clearing arrangement adopted by the Commission for Channels 60-69 "outrageous," writing in a letter to Chairman Powell that the FCC is "[a]llowing industry to negotiate private marketplace deals that dictate the governance and the transfer of spectrum and to earn profits on the spectrum through such arrangements . . . ."

NAF, *et al.* believe the FCC's Order concerning band-clearing on Channels 60-69 is a

[34] See Sen. Ernest Hollings, Letter to FCC Chairman Michael Powell, October 17, 2001; Norman Ornstein and Michael Calabrese, Letter to Michael Powell, Nov. 2, 2001; Michael Calabrese, "The Great Airwaves Robbery," Issue Brief, New America Foundation (Nov. 2001). All three documents are available on NAF's Public Assets

disturbing precedent because in the recent past incumbents relocated from re-allocated spectrum (*e.g.*, military users on 1710-1755, or microwave incumbents on the auctioned PCS spectrum) were entitled to actual compensation for costs – but were certainly not allowed, in effect, to appropriate the public value of the asset through a private "sale." Although the benefits of quickly clearing at least a portion of the 60-69 band for public safety made this an unusual and difficult case, Commentors certainly hope the Commission will make it clear that the goal of promoting spectrum "flexibility" does not require the forfeiture of substantial public revenues by allowing incumbent licensees to enter into similar "voluntary band-clearing agreements."

4. Auction methods are available to efficiently assign new flexible licenses among competing firms, to compensate the public, and to avoid "unjust enrichment."

As the Task Force notes in its request for comments, while there may be an emerging consensus that a more market-oriented allocation policy should grant licensees far greater flexibility and facilitate secondary markets for wireless bandwidth, the difficult issue is the transition from the outdated zoning-and-giveaway policy that continues to govern most incumbent licensees. In Question 2(f) the Task Force asks what the Commission should do to facilitate efficient restructuring of spectrum held by new licensees and incumbents. NAF, *et al.* would add, "to ensure the public receives a fair 'rent' in the future in a manner that places all commercial licensees – and their business competitors – on a level playing field with respect to the availability and cost of this public resource." As noted above, it would be unfair, inefficient and contrary to statute if the Commission administratively created new licenses with property-like rights and arbitrarily assigned them to firms that happened to be incumbent licensees, transferring in the process an enormous windfall from the public (and from competing firms) to the lucky incumbents. Any auction process that gave incumbents preferential treatment beyond

the protection or reimbursement of reasonable sunk capital costs would be similarly flawed.

Although Commentors cannot present the Task Force with a single best solution, there clearly are a number of options available to Congress and the Commission that would avoid both windfalls and unfairness to incumbents.[35] These comments describe broad options below that would utilize auctions primarily as a tool for competitive, efficient assignment of scarce license rights among commercial users. However, Commentors wish to emphasize that regardless of the method used for initial assignment of these newly defined rights, **auctions should be combined with ongoing lease fees that would attach after the initial license period (*e.g.*, after 10 years) and only if the incumbent opts for renewal (alternatively the incumbent can return the license for re-auction).**

These ongoing lease fees serve several objectives: first, to provide the public with an ongoing and market-rate return on the public asset; second, to reduce the up-front auction cost of the new rights (since bidders would not be anticipating permanent, cost-free control); and third, to encourage capital investment by giving the new incumbents an option to convert after the initial period to a leasing arrangement with expectation of renewal. Although the lease fees would need to be initially defined by Congress and administered by the Commission, they should be modest and market-based. Once the new flexible, market-based allocation system is in place, for example, lease fees can be imputed based on secondary market transactions for spectrum with similar propagation characteristics.

It is not difficult to imagine options that accomplish the various policy objectives noted above. The most straightforward is to apply the method used to reallocate federal spectrum for

[35] *See, e.g.*, John Peha, "Spectrum Management Policy Options," 1 *IEEE Communications Surveys* 1 (4th Quarter 1998) (http://www.comsoc.org/livepubs/surveys/public/4q98issue/peha.html), for a discussion of policy options for assigning and governing spectrum licenses.

commercial use.[36] Congress or the Commission can set a series of dates based on license expirations when incumbent licenses will be reallocated to flexible use and auctioned rather than automatically renewed. As the statute requires licensees to sign a waiver stating they have no rights, interests or expectations beyond the term of the license, no statutory (or Fifth Amendment) bar exists to implementing this approach. In less than a decade, all commercial bands could be reassigned on a competitive basis. This process would also facilitate the reallocation of a sufficient share of prime spectrum for unlicensed use as its utility and consumer demand becomes more certain over the next several years.

Although incumbent licensees presumably would have a greater incentive to make the winning bid, incumbents will argue that auctioning their existing rights is unfair because they have ongoing business revenue and investments tied to those frequencies – and that the risk of losing their license in the future would have a chilling effect now on investments in new equipment. However, winning bidders could be required to compensate incumbents either for reasonable relocation costs (as bidders for spectrum relinquished by the military are required to do, or as winning bidders for PCS spectrum reallocated from Fixed Microwave Services were required to do),[37] or instead for the depreciated value of their capital equipment.

An option more favorable to incumbents would involve auctioning a new flexible-use license as an "overlay" license that permitted any use that did not cause harmful interference to

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[36] See National Telecommunications and Information Administration, Mandatory Reimbursement Rules for Frequency Band or Geographic Relocation of Federal Spectrum Dependent Systems, Final Rule, 47 CFR Part 301 (June 17, 2002), implementing the Strom Thurmond National Defense Authorization Act for FY 1999 (Pub. L. No. 105-261, codified at 47 U.S.C. 923(g)), which sought to encourage the transfer of spectrum from federal to private sector use by, *inter alia*, authorizing mandatory compensation payments to federal entities by successful auction bidders of the "marginal costs anticipated to be associated with such relocation or with modifications necessary to accommodate prospective licensees."
47 U.S.C. 923(g)(1)(A).

[37] *See, e.g., Amendment to the Commission's Rules Regarding A Plan for Sharing the Costs of Microwave*

the existing service already operating on the band. Incumbents could bid for these new license rights – and in many cases would have an economic incentive to do so. But the key feature here is the inversion of the current assumption that because a frequency is licensed for a particular service, that licensee has the ability to block other non-interfering uses of the band. Indeed, it is possible that after a reasonable number of years, the incumbent's rights could wear away; for example, the burden of proving "harmful interference" from competing uses of the band could eventually shift, or become subject to adjudication by some new interference dispute resolution system that may be created as part of the transition to a more flexible, market-driven allocation system.

An alternative to this "overlay" auction model, based on inter-tract auction models developed for the Department of the Interior for use in auctioning leases for mining coal from federal land, is being developed by Michael Rothkopf, an auctions expert and professor at Rutgers University. Rothkopf proposes an annual series of auctions, each of which releases a fixed percentage of the spectrum allocated to commercial use for flexible use, but subject to the rights of incumbents to continue their current service without harmful interference. However, because of the particular inter-tract auction method used, if incumbents value the extra flexibility they would have to compete with other bidders to have their license restrictions eased. Once all commercial spectrum is transitioned to the new license regime, lease fees could be levied upon renewal of the license. This method may ensure a return to the public while avoiding the need to take existing rights away from incumbent license holders.

Relocation, 11 FCCRcd 8825 (1996).

B. EFFICIENT MARKET-ORIENTED SPECTRUM ALLOCATION POLICIES WILL SERVE THE PUBLIC INTEREST WITHOUT VIOLATING THE PUBLIC TRUSTEE MODEL.

1. Spectral efficiency and consumer welfare can be enhanced by replacing spectrum 'zoning' with more flexible, market-based allocations.

Since the advent of radio in the mid-1920s, each new use for the airwaves (from FM radio, TV and satellite broadcasting, to commercial two-way radio services) has had to apply for its own exclusive and highly restrictive allocation. 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. As then-FCC Chairman Reed Hundt complained in 1995, "incumbents and competitors have incentives to slow down the FCC process and keep their protected status as long as possible."[38] One study estimated that regulatory delays in launching cellular phone service cost the U.S. economy more than $86 billion in economic activity.[39]

Of course, continued 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. But so long as incumbents hold "free" spectrum, they face no opportunity costs even when there is scarcity and the spectrum could be put to more productive use. It is a basic microeconomic principle that when any input to production is freely available – as spectrum is for all incumbents except those

[38] Reed E. Hundt and Gregory L. Rosston, "Spectrum Flexibility Will Promote Competition and the Public Interest," *IEEE Communications Magazine*, 40 (December 1995).

[39] J.H. Rohlfs, C.L. Jackson, and T.E. Kelly, "Estimate of the Loss to the U.S. Caused by the FCC's Delaying Licensing of Cellular Telecommunications," National Economic Research Associates (1991).

that acquired licenses through auctions since 1993 – there is insufficient incentive to use it cost-effectively, or at all. 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[40]. This will lead some incumbents to invest in more spectrum-efficient equipment, others to substitute wireline or public commercial services (*e.g.*, utilities using cell phones instead of private radios), and still others to sell out to new services willing to sublease or buy their license.

A filing before the FCC by 37 economic professors, most of them former government economists, explained why a more flexible and market-oriented approach would increase efficiency:

> The Commission has recognized that regulators have limited ability to plan markets. . . . But auctions for licenses have not changed the underlying system of spectrum allocation. . . . With few exceptions, spectrum continues to be offered to the market only as allocated and no price can be offered to reallocate it from the officially designated use. The situation has led to predictable outcomes: shortage and waste.[41]

In the mid-1990s, the FCC moved consciously toward a more flexible approach when it auctioned licenses for wireless personal communications services (PCS). Auctioned licenses were given a far greater degree of flexibility in responding to consumer demand than the "free" licenses for broadcasting and other purposes. In 1999, after years of rancorous internal debate, the FCC released a statement of guiding principles for its future activities in spectrum management. The FCC said it would:

> allow greater flexibility in allocations, . . . to provide regulatory neutrality for similar wireless services; promote new spectrum-efficient technologies, such as

[40] This rationale underlies the U.K.'s Wireless Telegraphy Act of 1998, which authorizes auctions, administrative fee setting and trading. See David Hendon, Chief Executive, UK Radiocommunications Agency, "The Challenges of Dynamic Radio Spectrum Management," National Telecom Agency of Denmark (February 2001) (http://www.tst.dk/dk/publikationer/jubileumsskrift/kap05.htm).

[41] FCC WT Docket No. 00-230, "Comments of 37 Concerned Economists" in response to FCC 00-402, "In the matter of Promoting Efficient Use of Spectrum Through Elimination of Barriers to Secondary Markets," (February 7, 2001). They concluded that the FCC should eliminate four categories of restrictions on licensees – eligibility requirements, service rules, technological standards and build-out requirements – that are not related to interference or anti-competitive concentration.

> ultra-wideband and spread spectrum operations; . . . encourage the development of secondary markets for spectrum (i.e., reselling of licenses to third parties) to ensure full utilization; and seek ways to make more spectrum available, through, for example, assigning user fees or by reclaiming existing spectrum.[42]

Howard Shelanski, a former FCC chief economist, has described this trend as "the administrative creation of property rights," observing that "although there are important differences between licensing and ownership, those alternatives are not as discrete as often portrayed."[43] For example, the old industrial policy of allocating "free" spectrum to firms deemed best qualified to deliver a specific service necessarily entailed restrictions on the ability of a licensee to subdivide bands, to lease frequencies to other parties, or to change its use. If these restrictions were minimized, it would facilitate a secondary market for wireless bandwidth, similar to markets that have developed for wireline bandwidth. "Just as a building owner can rent out space, a wireless service provider should be able to lease out the use of spectrum assigned to its license," the 37 economists stated in their FCC filing. 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.

However, in contradiction to its own 1999 statement of principles, the FCC has continued to shape the use of the airwaves on an exclusive service-by-service basis. Indeed, in July 2001, in its first major ruling on spectrum allocation under its new chairman, Michael Powell, the FCC appeared to return to the old "zoning-and-giveaway" industrial policy by granting 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

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[42] 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).

[43] Howard Shelanski and Peter Huber, "Administrative Creation of Property Rights to Radio Spectrum," 41 *Journal of Law & Economics* 581, 583 (October 1998).

spectrum.[44] Commentors urge the Task Force to recommend against such divergences from the 1999 statement of principles in the future.

2. The Commission should shift from auctions conveying long-term licenses to a "lease" or "royalties" model with a shorter but flexible license term.

Where scarce and valuable public assets are made available for commerce – such as the lease rights to extract coal and oil, cut timber and graze herds on public lands – a combination of auctions and lease fees generate billions of dollars in public revenue. Auctions, fees and royalties are typically used to allocate public assets for three reasons. One is to ensure that a scarce resource is assigned to firms that value it most highly. A second reason is that internalizing the opportunity cost of alternative uses gives licensees a financial incentive to use the resources efficiently. A third objective is to provide a fair return to the public, revenue that can either help to reduce other taxes, or which can be earmarked to pay for public investment in the same sector.[45]

While TV and radio broadcasters occupy the largest portions of 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 (sometimes called "wireless cable"), and private land mobile services, which are two-way radio services shared by firms in a variety of industries, including petroleum, taxicabs, forest products and utilities. The original

[44] On July 17, 2001, the FCC authorized eight new mobile satellite service systems to provide service using the 2 GHz band; see FCC DA 01-1631 through 01-1638, issued in response to FCC 00-302, "In the Matter of the Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band" (August 25, 2000).

[45] An example of auction, lease and royalty fees paid on a public asset is the Outer Continental Shelf Lands Act of 1953, which has yielded over $122 billion in revenues to the federal government and coastal state governments since 1954. The OCSLA aims to provide "orderly leasing of these lands, while affording protection of the environment and ensuring that the federal government receives fair value for both lands leased and the production that might result." Successful bidders for tracts pay a combination of "bonuses" (up-front cash payments to secure a lease tract), rent of leased tracts (to incent active use of the tract), and royalties on oil or gas production). Congressional Research Service, "Outer Continental Shelf: Oil and Gas Leasing and Revenue," May 2000. Federal OCS revenue is earmarked for investment through the Land and Water Conservation Fund, a trust fund established in 1964 for the purpose of acquiring new recreation lands, and the National Historic Preservation Fund. See Congressional Research

analog cellular telephone licenses given away during the 1980s have never been auctioned and boosted their recipients' stock market values by about $46 billion as of 1991, according to a U.S. Department of Commerce estimate.[46]

Some free market economists advocate permanent privatization of the airwaves. Their long-held view is that creating permanent private ownership rights in spectrum frequencies is the most efficient way to cope with the scarcity and interference problems that justify licensing.[47] Exclusive property rights in spectrum, they argue, can encourage optimal amounts of investment and interference with reduced transaction costs. In this Coasean view, the economic efficiency of using a price mechanism should therefore prevail over a historic conception that the airwaves are inherently a commonly-owned asset. While it may be true that the use of a price mechanism for initial assignment, flexible usage rights, and facilitating secondary markets for wireless bandwidth would improve the efficient allocation of frequencies licensed for commercial use, this by no means necessitates private ownership (or "propertizing," as one advocate calls it[48]). Private property itself is not absolute, but rather a bundle of rights that are "strong" or "weak" in various respects. Along the continuum between central planning and complete privatization, private rights in spectrum licenses can be defined that 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" licenses conferred as an instrument of FCC industrial policy. A substantial degree of market-oriented flexibility can be granted by

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Service, "Land and Water Conservation Fund," March 2001.

[46] US Department of Commerce, *U.S. Spectrum Management Policy: Agenda for the Future*, NTIA, D6 (1991).

[47] *See, e.g.,* Thomas W. Hazlett, "The Wireless Craze, The Unlimited Bandwidth Myth, The Spectrum Auction Faux Pas, and the Punchline to Ronald Coase's 'Big Joke'," *Harvard Journal of Law and Technology* (Spring 2001, forthcoming) (http://www.aei.org/scholars/hazlett.htm), and R.H. Coase, "The Federal Communications Commission," 2 *Journal of Law & Economics* 577 (1959).

[48] Lawrence J. White, "'Propertizing' the Electromagnetic Spectrum: Why It's Important and How to Begin," in J.A. Eisenach and R.J. May, eds., *Communications Deregulation and FCC Reform: What Comes Next?*, 9 Media

license for limited and relatively short periods, as now required by statute, without denying the public a fair monetary return on a valuable public asset, or foreclosing the ability of Congress and the Commission to reorganize social use of the airwaves as technologies and social needs evolve over time.

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.

i) ***Spectrum policy is not budget policy***

An unfortunate aspect of the current auction system is the statutory requirement to deposit auction funds in the general Treasury. 47 USC §309(j)(8(A). While Congress intended this as a means of recouping the value for the general public, it has had the unfortunate effect of subordinating spectrum policy to fiscal policy. As discussed below, a far better approach would be to earmark spectrum funds for new public investments. Commentors recognize that it is Congress that must make this change, although NAF, *et al.* urge the Task Force to endorse this approach.

The Commission, however, must never conflate spectrum policy with budget policy. Indeed, Congress explicitly prohibited the Commission from considering the expected revenue when evaluating whether to employ auctions, and limited the ability of the Commission to consider revenue generation when formulating rules for auctions. 47 USC §309(j)(7)(A)-(B).

Accordingly, all frequencies that can be made available for commercial purposes, less those set aside for unlicensed or other noncommercial uses, should be auctioned as soon as possible, without consideration as to whether this will "depress the market" for spectrum

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Law & Policy 19 (2000).

licenses. Recent auctions for spectrum have raised such startling sums in part because federal industrial policy – and the political influence of incumbents – has exacerbated the shortage and uncertainty surrounding allocations for advanced wireless services. Policy makers should use the market and compensate the public – but not manipulate auctions as an instrument of budget policy. Auctions should be primarily used as a tool to select among competing potential users of a band that is being reassigned, typically from government to private use, or from a currently restricted use (*e.g.*, a site license for analog broadcasting) to a geographic and more flexible license. So long as the public maintains its future interest in spectrum rents, then lower initial auction receipts can be beneficial, since it leaves firms with more capital to roll-out new and presumably valuable consumer services.

ii) ***Licenses should be for strictly-defined periods***

Whatever price mechanism is used, it is critical that licenses be issued for a defined period of time and not imply entitlements in perpetuity. As noted above, Section 301 of the Communications Act explicitly authorizes the FCC to assign licenses only "for limited periods of time." Yet the longstanding practice of automatically renewing licenses must not become a roadblock to balanced reform. If society's common ownership of the airwaves is inalienable, then the public's future returns and flexibility to alter today's regulatory regime should not be overly constrained. One problem with recent auctions of spectrum to wireless phone companies is that they appear designed 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. This stands in contrast to European 3G auctions that explicitly state licenses revert to the government, typically after a longer (*e.g.*, 15-year) initial license period.

Auctions should not be designed – or even perceived – as a means of collecting today the present value of all future rents. One obvious reason is that the future value of the airwaves is highly speculative. Nobody knows the relative value or appropriate regulatory configuration for spectrum in the year 2030 – let alone in 2130. Another important reason, discussed below, is that as technology changes society may benefit most from a radical change in the way spectrum is allocated and utilized – changes that already plausibly include a dramatic reduction in the share of spectrum licensed for exclusive private use. Unlike grazing land and other tangible assets, the American people have less than 80 years worth of experience with the best way to organize the social use of spectrum.

II. TO PROMOTE FREE EXPRESSION AND INNOVATION, THE COMMISSION SHOULD RESERVE INCREASING AMOUNTS OF PRIME SPECTRUM FOR UNLICENSED USE AND ADOPT RULES TO FACILITATE A "SPECTRUM COMMONS."

While there appears to be a general consensus in support of spectrum "flexibility" for commercial licensees, there is insufficient attention to the need to preserve policy flexibility to adapt to changing technologies and consumer preferences.[49] 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 more than 50-year-old subdivision scheme based on exclusive control of discrete channels and guard bands may soon prove as inefficient as requiring that land be subdivided using only circular plots. A growing number of scientists and engineers believe that assumptions about scarcity and interference that underlie today's exclusive licensing model may be temporary constraints that can be solved through advances in technology

[49] The government's ongoing fiduciary responsibility to manage spectrum allocation so that adequate non-commercial bands are set aside for both society's collective needs and for the exercise of unmediated communication by individual citizens is legitimate and derives from the fact that the airwaves, like the atmosphere itself, is a commonly-owned natural system. *See* Gerald Torres, "Who Owns the Sky?" 18 *Pace Environmental L.*

and architecture.

A current example of why Congress and the FCC must preserve its ability to reconsider the allocation of frequencies in response to changes in technology and social needs is the rapidly growing demand for wireless networking using unlicensed spectrum. Emerging technologies allow for the dynamic sharing of frequencies by multiple users without licensing, an approach generally known as "open spectrum." The rapid proliferation of wireless community networks using WiFi (IEEE 802.11) technology suggests a tremendous potential demand for wireless networking and shared wireless connections to the Internet using unlicensed bands once derided as "junk" spectrum.[50] There are already more than 10 million WiFi devices installed and some 4,000 public wireless access points in locations such as airports, hotels and cafes.[51] At present a rather arbitrary mix of unlicensed devices (from wireless LANs to microwave ovens, cordless phones and baby monitors) share a modest 83.5 MHz unlicensed band in a prime portion of the spectrum (at 2.4 GHz) that propagates well through walls and weather. Despite this, the amazing growth of both commercial and nonprofit networks based on the 802.11b protocol suggests that open spectrum can work.

Beyond WiFi, which remains a very localized, hub-and-spoke architecture for the limited purpose of accessing a shared wireline Internet connection on a wireless basis, a growing number

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Rev. 227 (2001) for an overview of the legal status of common assets and the application of the public trust doctrine to federal management of the atmosphere and emissions trading.

[50] WiFi operates in the 2.4 GHz Industrial, Scientific and Medical (ISM) band and delivers up to 11 megabits per second connections over short distances. WiFi is only one of a number of emerging wireless networking technologies designed to operate on unlicensed spectrum, or in the case of Ultra-Wideband, across wide ranges of licensed and unlicensed bands. Related standards operating at higher speeds include 802.11a (WiFi5), which operates in the 5 GHz U-NII band at up to 54 mbps; 802.11g, which delivers higher-speed connections in the 2.4 GHz ISM band; and 802.11e, which adds quality-of-service mechanisms for voice and video delivery. Bluetooth and other PAN technologies (802.15), as well as unlicensed metropolitan-area networking (802.16), are additional technologies developed for unlicensed use. Unlicensed technologies hold promise as well for solving the "last mile" obstacle to rapid and more widespread access to affordable high-speed Internet connections.

[51] For an excellent overview of the open spectrum concept and the entrepreneurial activity validating its economic and social potential, s*ee* Kevin Werbach, "Open Spectrum: The Paradise of the Commons," *Release 1.0*, November

of engineers and technologists believe that assumptions about scarcity and interference that underlie today's exclusive licensing model may be temporary constraints that will soon be solved through advances in technology and architecture.[52] Paul Baran, who invented the packet-switching network principles behind the Internet and later founded Metricom, argued in 1994 that spectrum scarcity is a policy choice; and that digital and spread spectrum modulation could largely eliminate scarcity by allowing a large number of users to dynamically share the same frequencies.[53] This technology, known as open spectrum, can further the Commission's mandate to promote the public interest in competition, innovation and democratic discourse. As emerging technologies permit both more efficient re-use of spectrum and more democratic access to the airwaves, we should not foreclose the practical ability to greatly increase allocations of unlicensed spectrum.

Much as the Amateur Radio Service has long operated as a "commons," a meshed network of smart devices has the potential to promote democratic communication through a "spectrum commons" operating on unlicensed spectrum. Leading engineers and entrepreneurs are already developing and deploying wireless communications networks, based on ad hoc, meshed architectures and Internet-like design principles, that are potentially far more extensive and spectrum efficient than today's WiFi systems.[54] Using smart "software-defined radios,"

20, 2001 (http://www.release1-0.com).

[52] *See* David P. Reed, "Why Spectrum Isn't Like Property," presentation to Open Spectrum Working Group, May 18, 2001 (http://www.reed.com/dprframeweb/dprframe.asp). Reed, a former professor of computer science and engineering at MIT and a developer of the original Internet, argues that spectral capacity can scale with demand by using "cooperative" wireless architecture interconnected with wired/fiber networks.

[53] Paul Baran, "Visions of the 21st Century Communications: Is the Shortage of Radio Spectrum for Broadband Networks of the Future a Self-Made Problem?" Keynote Address, 8th Annual Conference on Next Generation Networks (Washington, DC, November 9, 1994) (available online at http://www.eff.org/GII_NII/Wireless_cellular_radio/ false_scarcity_baran_cngn94.transcript).

[54] For a summary of the technical elements, economic impacts and implications for democratic values and individual autonomy, *see* Yochai Benkler, "Open Spectrum Policy: Building the Commons in Physical Infrastructure," presentation at the New America Foundation conference "Saving the Information Commons," May 10, 2002 (*http:// www.newamerica.net/Download_Docs/pdfs/Doc_File_122_1.pdf*).

nodes in unlicensed wireless networks can cooperate to dynamically share spectrum and to serve as repeaters for traffic between nodes.[55] They can dynamically adjust power levels and coding schemes based on the behavior of other nodes.[56] Because each new user becomes a relay node that adds network capacity, as well as demand, the wide band communications and dynamic sharing envisioned by open spectrum pioneers could reuse spectrum far more efficiently than centralized cellular systems. Wireless bandwidth would therefore become less scarce and more ubiquitous. End users would define the highest value use of spectrum "use-by-use," on a decentralized market model, rather than relying on a spectrum owner to bureaucratically allocate capacity based on estimates of demand in advance of providing the service.[57]

Kevin Werbach, a former FCC staffer and technology writer, filed comments with the Task Force that articulate the tension between the traditional model of exclusive licensing and this new entrepreneurial model for shared, unlicensed use:

> The traditional licensing model assumes that spectrum is scarce, and must be carefully partitioned and handed out to companies best able to make use of it. Open spectrum turns that model on its head. Sharing means that spectrum is less scarce than it previously seemed. …
>
> All this, however, requires that spectrum be available for shared, unlicensed use. …Companies that pay for spectrum licenses have incentives to keep that spectrum to themselves rather than allow in additional competitors, even if competition would maximize social welfare. Flexibility *per se* is not the problem. So long as the Commission makes enough spectrum available for unlicensed use, with the characteristics necessary for exploitation by the private sector, flexibility within the licensed bands would be beneficial.[58]

Unlike advanced wireless ("3-G") networks mediated by commercial providers, wireless

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[55] See David P. Reed, "How Wireless Networks Scale: The Illusion of Spectrum Scarcity," Presentation to Silicon Flatirons Telecommunications Program, University of Colorado at Boulder, March 5, 2002 (http://www.reed.com/dprframeweb/dprframe.asp).

[56] Kevin Werbach, "Here's a Cure for the Broadband Blues," ZDNet, Nov. 28, 2001 (http://zdnet.com.com/2100-1107-51165.html).

[57] *Ibid.*

networks of personal devices will serve important First Amendment values if it enables direct peer-to-peer communication and/or operate using the same architectural principles as the Internet – that is, as an open access, end-to-end infrastructure free from the content constraints (and rent-seeking) of licensed private intermediaries.[59] When the government makes choices about the distribution and openness of communications capabilities over the public airwaves, important First Amendment values weigh in favor of enabling free individual communication and open access to diverse sources of information.[60] In *Turner Broadcasting System, Inc. v. FCC*, Justice Breyer, concurring in the Court's rejection of the claim that the right of cable operators to be free from "forced speech" was violated by statutory "must carry" obligations, wrote: "I believe that this purpose – to assure the over-the-air public 'access to a multiplicity of information sources,' ...– provides sufficient basis for rejecting appellants' First Amendment claim."[61]

Yochai Benkler, a professor of law at New York University, has described why democratic values support the facilitation of unlicensed wireless communication:

> Because unlicensed wireless devices require no wires and no privately owned spectrum allocations, there is no large initial investment to be made, and thus no entity whose investment-backed claims demand centralized control. . . . The network can be deployed piecemeal, by each additional user who joins a network, or by small groups, organized through private enterprise or public/community organizations, working independently of each other.
>
> ... It can be the infrastructure of first resort for those who cannot pay for information on a continuous basis, similar to over-the-air television today. Unlike television, unlicensed devices will allow those who rely on them to be producers of information and knowledge, and not solely its objects. Unlicensed devices also offer an infrastructure of last resort for

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[9] Comments of Kevin Werbach, In the Matter of Spectrum Policy Task Force, ET Docket No. 02-135, July 8, 2002.

[59] *See* Yochai Benkler, "Overcoming Agoraphobia: Building the Commons of the Digitally-Networked Environment," 11 *Harvard Journal of Law & Technology* 287 (Winter 1998). See also Yochai Benkler, "The Commons as a Neglected Factor of Information Policy," *Telecommunications Policy Research Conference* (September 1998) (http://www.law.nyu.edu/benklery/commons.pdf). Some even predict technology will allow all spectrum to be unlicensed by eliminating spectrum scarcity. See George Gilder, "Auctioning the Airwaves," 153 *Forbes ASAP Supplement* 8, 99-112 (April 11, 1994).

[60] Benkler, "Overcoming Agoraphobia," at 87-89.

[61] 520 U.S. 180, 226 (1997) (Breyer, J. Concurring).

> those who are refused the facilities of owned infrastructure because their views are unorthodox or offensive, or because the information they offer is valuable to too small a market segment for infrastructure owners to consider worthwhile.[62]

Questions 5: The Commission Should Expand and Facilitate Unlicensed Communication

This more entrepreneurial and democratic vision is likely to require new allocations of unlicensed spectrum and liberalized rules to allow ultra-wideband transmissions to spread over a wide range of frequencies currently used by other services. 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.

There are three general sets of initiatives the Commission can undertake to expand and facilitate unlicensed communication in a manner that both promotes spectral efficiency and First Amendment values. First, the Commission should study whether additional "spectrum parks" should be set aside to encourage unlicensed use. There may well be a need to designate different unlicensed bands for different purposes. For example, the Commission should consider whether the demonstrated demand for *ad hoc* wireless networking – and its enormous potential – justifies a designated allocation designed with open protocols to facilitate expansion and quality of service. Second, the Commission should study whether equipment-certification rules and "etiquette" protocols are needed to ensure that transmitters in new unlicensed bands cooperate intelligently for maximum efficiency.[63] In addition, and at a minimum, the Commission should immediately move to remove barriers to the deployment and use of unlicensed wireless

[62] Benkler, "Overcoming Agoraphobia, *supra* note 59, at 97-98.

[63] See Kevin Werbach, Letter to FCC Chairman Michael Powell, November 26, 2001. In his comments filed in this inquiry Werbach urges the Commission to develop an "Intelligent Radio Bill of Rights" and equipment-certification rules "defining the privileges and responsibilities of smart devices communicating over the airwaves, to create

technologies, including but not limited to ultra-wideband and 802.11 protocols operating in the 2.4 and 5 GHz bands.

On the other hand, protocols to facilitate wireless networking on unlicensed spectrum should *not* come at the price of limiting the freewheeling innovation possible on the current "junk" band of unlicensed at 2.4 GHz; it is precisely the wide-open character of this band (or another, larger space designated in its place) that allows an entrepreneurial technology like WiFi to develop. The Commission should not foreclose future innovation by placing service rule-like restrictions on the primary band available for unlicensed experimentation.

III. THE COMMISSION SHOULD CONTINUE THE PRACTICE OF SETTING ASIDE SPECTRUM FOR NON-COMMERCIAL USES.

The policy of setting aside spectrum for non-commercial use has served the American people well. In addition to the well-known example of non-commercial television and non-commercial radio, which provide valuable programming choices to the public, the ITFS service allowed many educational programmers to pioneer distance learning and, now that the Commission has broadened flexibility for the service, are experimenting with other educational services.

Setting aside new spectrum exclusively for non-commercial uses must remain a key element of the Commission's spectrum policy. Non-commercial licensees provide valuable services to the public in situations where commercial licensees would not provide such services because the financial return would prove insufficient. In addition, in the provision of content, non-commercial licensees ideally seek audiences neglected by the mainstream. Many non-commercial licensees, by their nature, have close ties to their communities and reach out to non-mainstream constituencies.

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incentives for efficient cooperative use of unlicensed spectrum." Comments of Kevin Werbach, In the Matter of Spectrum Policy Task Force, ET Docket No. 02-135, July 8, 2002.

The consistent policy of Congress and the Commission to allocate spectrum for non-commercial licensees has well served the public interest by fostering the development of innovative types of programming – particularly children's programming – and new educational services that utilize the public airwaves. The Task Force should therefore endorse setting aside further spectrum for non-commercial uses.

IV. THE COMMISSION SHOULD SUPPORT CONGRESSIONAL INITIATIVES TO EARMARK SPECTRUM FEES FOR PUBLIC INVESTMENT.

Ideally, revenue from the private use of the airwaves would be rebated directly back in equal amounts to every American, much as the Alaska Permanent Fund pays an annual dividend to every citizen of that state (nearly $2,000 per Alaskan last year) from income earned on public royalties from North Slope oil. However, spectrum revenue is too small relative to the U.S. population, and too irregular, to justify the administrative cost.

Alternatively, the revenue could offset income tax liabilities by flowing into the general Treasury – which is, in fact, current policy. Instead of a public subsidy for broadcasters and other firms receiving free use of spectrum, a market rate of return can generate public revenue that reduces other taxes and/or is available for new public investment.

When our nation monetizes a common asset, it seems preferable to reinvest that windfall in new public assets of broad public benefit. Perhaps the most relevant way to think about reinvesting spectrum revenue is for the purpose of fulfilling the "public interest obligations" that originally justified giving broadcasters free monopoly-like access to the airwaves. These unmet public needs include quality children's and educational programming, local public service media, expanded civic discourse, and media time for political candidates to communicate with voters.[64]

[64] *See* Henry Geller and Tim Watts, "A Spectrum Fee to Replace the 'Public Interest Obligations' of Broadcasters," Working Paper, New America Foundation, May 2002; Paul Taylor and Norman Ornstein, "A Broadcast Spectrum

These new public investments could include educational content and innovative software that makes meaningful the federal E-Rate program that has been wiring our nation's public schools and libraries to the Internet, as well as funding to expand local and national content for noncommercial media that takes advantage of the multi-channel capacity of digital public broadcasting and of the Internet.[65]

A number of recent proposals offer compelling visions of the sort of investments needed to maximize the public benefits of new technologies such as the Internet, software, and broadband networks. Most significantly, former FCC Chairman Newton Minow and former PBS President Lawrence Grossman have proposed the creation of a "Digital Opportunity Investment Trust" that would support innovative uses of digital technologies for education, lifelong learning, and the transformation of our civic and cultural institutions.[66] Under their proposal, an initial $18 billion in revenue from upcoming spectrum auctions would be allocated to capitalize the trust fund, yielding a permanent revenue stream of $1 billion or more for investments. Rep. Ed Markey (D-MA) recently introduced legislation that incorporates this concept, proposing that spectrum revenue be earmarked for a Digital Dividends Trust Fund. Senators Christopher Dodd (D-CT) and James Jeffords (I-VT) introduced similar legislation in the Senate on June 10, 2002.

As they observed, the United States has a long and highly successful tradition of using public assets to invest in education. In the 19th century, for example, at the height of the Civil War, Congress passed the Morrill Act, signed by President Lincoln, which granted the states tracts of federal land for the purpose of establishing land grant colleges that today number among the nation's leading universities. Despite the pressing crisis and the need for funds to support the

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Fee for Campaign Finance Reform," Working Paper, New America Foundation, June 2002.

[65] Thomas A. Kalil, "Designing a Digital Opportunity Investment Trust," Working Paper, New America Foundation, June 2002.

war, Congress chose to look forward and invest in educational institutions for future generations of Americans.

Similarly, it behooves Congress and the Commission today to look to the educational needs of the citizens of the United States. The foresight of previous generations to invest in the intellectual capital of America has allowed the United States to take a pre-eminent position in the world today. Initiatives such as the Digital Opportunity Investment Trust will allow the United States to continue to hold such a position tomorrow.

CONCLUSION

The Spectrum Task Force has before it a daunting task, and this NOI represents only the first step in a long process to bring the spectrum allocation policy of the United States into line with modern technology. To guide it, the Task Force must look to the bedrock principle of the Communications Act, supported by the First Amendment of the Constitution: that the FCC must manage the use of the public airwaves as a public trust. With this principle as its guide, the Task Force can recommend policies that will ensure the continued vigor and innovation of the American wireless industry and enhance the opportunities for civic discourse.

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

Above all, the Task Force must avoid the trap of creating a class of privileged incumbents capable of locking up wireless applications against any new challengers or "disruptive" technologies – or of demanding windfall profits as ransom for transferring spectrum to a more valuable use. "Leases," rather than "property rights" provide sufficient incentive for innovation while preserving the public ownership of the airwaves. At the same time, the Commission should continue to allocate spectrum for non-commercial uses and wireless "spectrum commons" uses.

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July 8, 2002