
THE LAW OF PROPERTY AND THE LAW OF SPECTRUM: A CRITICAL COMPARISON

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The life of the law has not been logic: it has been experience . . . The substance of the law at any given time pretty nearly corresponds, so far as it goes, with what is then understood to be convenient; but its form and machinery, and the degree to which it is able to work out desired results, depend very much upon its past.

- Oliver Wendell Holmes, Jr.¹

I. INTRODUCTION

Debate rages about whether the allocation and management of the radio frequency spectrum² should be mostly a political process, treating it as “The People’s Airwaves,” or mostly market-driven, treating it as private property. Those who favor political management warn of “a few corporations controlling the people’s airwaves”³ and downplay the First Amendment⁴ as merely

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¹ OLIVER W. HOLMES, JR., *THE COMMON LAW* 1-2 (Little, Brown & Co., 1881).

² For simplicity, we will use the word “spectrum” to refer to the radio frequency spectrum. We do not mean “spectrum” to include the media by which light and noise audible to humans are transmitted. We also understand that, strictly speaking, the spectrum by which communication is possible is the transient interactivity of electrons rather than relatively permanent and tangible elements such as land or water.

³ Richard L. Grossman, *Wresting Governing Authority from the Corporate Class: Driving People into the Constitution*, 1 SEATTLE J. SOC. JUST. 147, 148 (2002); see also ROBERT W. MCCHESENEY & JOHN NICHOLS, *OUR MEDIA, NOT THEIRS: THE DEMOCRATIC STRUGGLE AGAINST CORPORATE MEDIA* (Seven Stories Press, 2002); Michael J. Copps, *The “Vast Wasteland” Revisited: Headed for More of the Same?*, 55 FED. COMM. L.J. 473, 478 (2003) (stating “the public interest . . . is the service broadcasters are supposed to provide in return

“aspirational.”⁵ In contrast, the market/property rights side sees television, for example, as “just another appliance—a toaster with pictures,”⁶ and calls for the spectrum to be “propertyzed”⁷ so that its potential may be realized.⁸

This article attempts to shed some light on these arguments, which have generated much heat. In particular, this article critically examines an analogy between property law, especially about land, and the way the United States treats the spectrum. This analogy has its roots in the observation, first made by Ronald Coase almost half a century ago, that both spectrum and land are scarce resources that require some allocation mechanism, and that the price system coupled with property rights provides an efficient allocation.⁹ A common assumption by many who have posited this analogy has been that the law has handled land in an efficient manner producing an efficient outcome¹⁰ – but has not done as well with spectrum. From here, it is straightforward to conclude that spectrum law and policy should be revised, or perhaps largely scrapped, so as to make this resource more property-like.

The analogy between property law and spectrum law, however, is both overstated and underdeveloped. The analogy is overstated because spectrum was defined in some of the earliest telecommunications law as not being property *per se*. The Communications Act of 1934 specifically states that its purpose is to allow the “use” by persons of all the “channels of radio transmission . . . but not the ownership thereof.”¹¹ It is true that over time spectrum has acquired property-like characteristics, such as longer license

for their licenses to use the people’s airwaves.”). As we note below, a new version of the political management side is that the spectrum should consist of government-defined “commons” or parks. See generally Kevin Werbach, *Supercommons: Toward a Unified Theory of Wireless Communication*, 82 TEX. L. REV. 863 (2004).

⁴ The First Amendment to the U.S. Constitution provides that “Congress shall make no law . . . abridging the freedom of speech, or of the press . . .” U.S. CONST. amend. I.

⁵ JAMES P. STEYER, *THE OTHER PARENT: THE INSIDE STORY OF THE MEDIA’S EFFECT ON OUR CHILDREN* 129 (Atria Books, 2002) (“The First Amendment is romantic. It is aspirational.”).

⁶ Caroline E. Mayer, *FCC Chief’s Fears: Fowler Sees Threat in Regulation*, WASH. POST, Feb. 6, 1983, at K1 (quoting former FCC Chairman Mark Fowler).

⁷ See generally Lawrence J. White, “Propertyizing” the Electromagnetic Spectrum: Why It’s Important, & How to Begin, 9 MEDIA L. & POL’Y 19 (2000).

⁸ See generally Stuart Minor Benjamin, *Spectrum Abundance & the Choice Between Private & Public Control*, 78 N.Y.U. L. REV. 2007 (2003).

⁹ Ronald H. Coase, *The Federal Communications Commission*, 2 J. L. & ECON. 1, 14 (1959).

¹⁰ RICHARD POSNER, *ECONOMIC ANALYSIS OF LAW* 29-33 (Little, Brown & Co., 1986). Posner advanced the proposition that the common law, as it pertains to property, is generally efficient. *Id.* By this, it is meant that the development and protection of property rights creates incentives for owners of scarce resources to use these resources efficiently and address conflicts between competing users efficiently. *Id.*

¹¹ 47 U.S.C. §301 (2000).

terms with an expectation of renewal, some flexibility in how the spectrum is used, and some ability to transfer the license to other parties; however, these rights are limited. For example, for most licensees, there is little flexibility that allows for different uses of the spectrum, and license transfers are subject to review by the Federal Communications Commission (“Commission”).¹²

The analogy is underdeveloped because, despite these differences, there are important parallels, both in terms of their defining characteristics and their development over time. Many of the defining characteristics of property also define spectrum. Both land and spectrum are valuable, divisible, and improvable with technology. Also, some kinds of land and spectrum are more productive than others.¹³ There is also a remarkable similarity between the laws, customs, and practices that have emerged over time to govern the usage of each. The same conflicts, the same defining traits, the same principles of decision, and the same solutions can be found in their respective backgrounds.

We agree that if property law is in fact more efficient than spectrum law, then making spectrum more property-like will improve efficiency. To talk of scrapping present spectrum law and replacing it with “property rights,” however, is to throw the baby out with the bathwater. First, improving spectrum law will require a better understanding of how it is similar to property law. Second, reform may most need to focus on the precise definition of rights to the spectrum. These rights were ill-defined almost 80 years ago and, despite the emergence of relatively efficient institutions for addressing spectrum use, remain in need of reform today. Finally, such reform must also recognize that, much as defining rights to land has not been simple, clarifying the rights to spectrum will be a complex task.

II. THE LAW OF LAND AND THE LAW OF SPECTRUM IN THE UNITED STATES

The following admittedly brief survey of the law of property, specifically land law, and the law of spectrum discusses the similarity between these bodies of law in terms of their early development, their key elements, and their means for resolving usage disputes.

¹² Much spectrum is regulated under a “command-and-control” model, with prescribed, narrow uses. For a discussion of flexibility in use and different regulatory models for spectrum, see FEDERAL COMMUNICATIONS COMMISSION, SPECTRUM POLICY TASK FORCE REPORT, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf (released Nov. 2002).

¹³ White, *supra* note 7, at 21.

A. Early Development

Virtually all land recognized under the jurisdiction of the United States started out as government property. The British colonies were originally comprised of tracts from the King or Queen of England,¹⁴ and westward expansions, such as the Louisiana Purchase, began with the U.S. government's acquisition of land from other entities or governments.¹⁵

Government subsequently made vast amounts of land available for private ownership. Periodic decisions over the first centuries of American history granted large and small amounts of land to “veterans, settlers, squatters, railroads, states, colleges, speculators, and land companies.”¹⁶ These policies were set by Congress and attempted to strike a balance between building essential infrastructure, e.g., railroads,¹⁷ development by small property-holders, e.g., homesteading¹⁸ and, eventually, conservation.¹⁹ Much land never became private property, such as land for police and fire departments, public schools and libraries, other government buildings, and public parks. Laws about other natural resources, such as air and water, also date back centuries.²⁰ They generally allowed less ownership and focused more on facilitating their use by many persons.²¹ In contrast to other resources, spectrum was first used in the United States very recently, about a century ago. The military at first claimed it all for the purposes of national defense and safety at sea.²² However, other users such as hobbyists and early broadcasters grew so fast and in such

¹⁴ LAWRENCE M. FRIEDMAN, *A HISTORY OF AMERICAN LAW* 59 (2d ed., Simon & Schuster, 1985).

¹⁵ *Id.* at 231; RICHARD B. MORRIS & JEFFREY B. MORRIS, *ENCYCLOPEDIA OF AMERICAN HISTORY* 150 (7th ed., HarperCollins Publishers, Inc., 1996).

¹⁶ FRIEDMAN, *supra* note 14, at 231.

¹⁷ *Id.* at 414-15.

¹⁸ PAUL JOHNSON, *A HISTORY OF THE AMERICAN PEOPLE* 289-96, 490-92, 515 (HarperCollins Publishers, Inc., 1997); MORRIS & MORRIS, *supra* note 15, at 612-13.

¹⁹ FRIEDMAN, *supra* note 14, at 352, 419-20.

²⁰ Contrary to some property rights folklore, government regulation of important resources and economic activities was intense in the colonial and early American times, and did not appear first with the New Deal. FRIEDMAN, *supra* note 14, at 66-67, 183-85; *THE OXFORD COMPANION TO AMERICAN LAW* 376 (Kermit L. Hall et al. eds., Oxford Univ. Press 2002) (hereinafter HALL ET AL.).

²¹ *See, e.g.,* Parker & Edgarton v. Foote, 19 Wend. 309 (N.Y. 1838) (rejecting the English doctrine of ancient lights); *see also* FRIEDMAN, *supra* note 14, at 365-66.

²² *See generally* ERIK BARNOUW, *A TOWER OF BABEL: A HISTORY OF BROADCASTING IN THE UNITED STATES, VOL. I – TO 1933* (Oxford Univ. Press, 1966); MARVIN R. BENSMAN, *THE BEGINNING OF BROADCAST REGULATION IN THE TWENTIETH CENTURY* (McFarland & Co., 2000); SUSAN J. DOUGLAS, *INVENTING AMERICAN BROADCASTING, 1899-1912* (Johns Hopkins Univ. Press, 1988); CHRISTOPHER H. STERLING & JOHN M. KITTROSS, *STAY TUNED: A HISTORY OF AMERICAN BROADCASTING* (Lawrence Erlbaum Assoc., 2002).

numbers that government was forced to allow significant private use.²³ The federal government formally nationalized the spectrum in 1927, but significant use by private persons, mainly for broadcasting, had already become widespread.²⁴ The federal government, while prohibiting some uses and forbidding persons to own spectrum, allowed most existing private uses of spectrum to continue under licenses.²⁵ As with land, government (usually through Congress) provided as it thought best for the country's essential infrastructure (national defense and other federal activities on spectrum retained by the federal government, safety-related communications, and broadcasting networks), homesteading (granting licenses for spectrum to persons who had pioneered its use), and conservation for future use.²⁶

B. Key Elements

In terms of maximizing efficiency, the most critical rights associated with any property generally are the rights to exclude others from its use, to determine how the property will be used, and to transfer these rights to others.²⁷ For example, the owner of land may expect to have his or her rights protected against trespassers. Similarly, an owner may decide how, or in what manner, to use his or her land. Finally, the owner of land may transfer it to other parties, either partially, as in the case of easements, rentals, or parcel sales, or completely, as in a fee simple sale of the entire seller's land to one buyer.

Yet landowners' rights are limited, substantially in some cases, by law and regulation. Among other limitations, zoning and environmental laws may regulate the minimum or maximum amounts of land that may be owned by one person, the types of structures that may be built on it, and the various uses to which a piece of land may be put.²⁸ For example, zoning that classifies land as "residential" prohibits it to be used for a night club or toxic waste dump. Transfers, too, are subject to zoning, environmental, and other restrictions. The buyer of land that is zoned for residential use may not, simply by buying

²³ See generally BARNOUW, *supra* note 22; BENSMAN, *supra* note 22; DOUGLAS, *supra* note 22; STERLING & KITTROSS, *supra* note 22.

²⁴ See generally BARNOUW, *supra* note 22; BENSMAN, *supra* note 22; DOUGLAS, *supra* note 22; STERLING & KITTROSS, *supra* note 22.

²⁵ See generally BARNOUW, *supra* note 22; BENSMAN, *supra* note 22; DOUGLAS, *supra* note 22; STERLING & KITTROSS, *supra* note 22.

²⁶ See generally BARNOUW, *supra* note 22; BENSMAN, *supra* note 22; DOUGLAS, *supra* note 22; STERLING & KITTROSS, *supra* note 22.

²⁷ See Erik G. Furubotn & Svetozar Pejovich, *Property Rights and Economic Theory: A Survey of Recent Literature*, 10 J. ECON. LIT. 1137, 1139-40 (1972); POSNER, *supra* note 10, at 29-33.

²⁸ *Village of Euclid v. Ambler Realty Co.*, 272 U.S. 365 (1926); HALL ET AL., *supra* note 20, at 847.

it, escape the “residential” limitation and operate a night club or toxic waste dump on the property.

In addition, if government wants to take privately owned land for public use, it may do so by its powers of “eminent domain,” although it must afford just compensation to the owner.²⁹ Conversely, even where land is open to the public, such as roads, parks, and sidewalks, government may set rules of good behavior, such as speed limits and laws prohibiting aggressive panhandling, and punish those who disobey them.³⁰

Many of the same restrictions that affect land use also affect the usage of spectrum by private companies and persons. Most of the spectrum that people use everyday is “zoned,” meaning that the Commission has allowed for relatively narrow use, e.g., AM radio or mobile service, and prohibited almost all others.³¹ In some bands, the Commission’s zoning has become relatively permissive in recent years. For example, licensees in the Personal Communications Service have more leeway than the earlier cellular licenses had in what they may do with their spectrum.³²

Similarly, spectrum licenses are transferable, though in practice they have been less so. All transfers of spectrum licenses are subject to review by the Commission to determine whether “the public interest, convenience, and necessity will be served thereby.”³³ Some, though not the majority, of all transfers of spectrum licenses are delayed by this review. Also, the threat of such review may deter some transfers that would otherwise occur. No such review occurs for transfers of land in the United States. In addition, until recently, there were prohibitions on dividing spectrum, either by frequency blocks (e.g., a licensee with 20 MHz transferring only 10 MHz to a buyer) or by geographic blocks (e.g., a licensee with spectrum in a geographic area

²⁹ FRIEDMAN, *supra* note 14, at 182; HALL ET AL., *supra* note 20, at 378; U.S. CONST. amend. V (“[N]or shall private property be taken for public use, without just compensation.”).

³⁰ *See, e.g.*, *Gresham v. Peterson*, 225 F.3d 899 (7th Cir. 2000) (upholding the constitutionality of a city ordinance prohibiting aggressive panhandling).

³¹ *See, e.g.*, 47 C.F.R. §2.106 (2003) (allowing 535-1605 kHz to be used for “broadcasting” and allowing 866-869 MHz to be used for “land mobile” service). In other bands, there are various users with primary or secondary status, though their respective rights generally are well-defined. *See, e.g.*, 47 C.F.R. §§2.106 (2003), US Footnote 218 (allowing 902-928 MHz to be used location and monitoring uses, but forbidding them to interfere harmfully with government stations and requiring that they “tolerate interference from . . . industrial, scientific, and medical . . . devices”).

³² *Compare In re An Inquiry into the Use of the Bands 825-845 MHz & 870-890 MHz for Cellular Communications Systems*, 86 F.C.C.2d 469, 507, para. 87 (1981) (relatively narrow definition of cellular service) with *In re Amendment of the Commission’s Rules to Establish New Personal Communications Services*, *Second Report and Order*, 8 FCC Rcd. 7700, para. 24 (1993) (relatively broad definition of broadband PCS).

³³ 47 U.S.C. §310(d) (2000).

transferring spectrum rights to only a portion of that area).³⁴

Also, the Commission occasionally exercises the equivalent of eminent domain by re-allocating spectrum and thereby effectively taking the rights of the previous users of that spectrum.³⁵ Approximating “just compensation,” the Commission usually makes the taking sufficiently slow so that the present user can establish itself elsewhere.³⁶ The Commission may also explicitly require that the new spectrum user compensate the user being ousted for the cost of moving to equivalent spectrum.³⁷ Finally, when the Commission creates a spectrum “commons” akin to a park or sidewalk, it often requires that users observe “spectrum etiquette” in order that the few not crowd out the many.³⁸

C. Resolving Disputes About Use

Many of the general rules and practices for spectrum use described above are the result, to paraphrase Justice Holmes, not of logic but of specific conflicts between two or more parties. New conflicts continue to occur, especially as more people use spectrum in different ways. The following discussion outlines the remarkable similarity between the principles by which disputes about the use of land and the use of spectrum are decided.

With land and other natural resources, a “nuisance” is one person’s substantial and unreasonable interference with the use and enjoyment of the resource by its possessor.³⁹ Its gist is unreasonable interference with use and enjoyment.⁴⁰ These same wrongs are recognized and regularly enforced in resolving disputes about radio spectrum. Disputes arise out of similar factual settings and thus similar principles are used to decide them. Often, more than one principle is invoked in a single case. The decision-maker, who may be a common law judge, a Commission attorney, or Commission engineer, must

³⁴ See *In re* Amendment to the Commission’s Rules to Establish New Personal Communications Services, *Memorandum Opinion and Order*, 9 FCC Rcd. 4957, 4982-86, 4889-90, paras. 80-83 (1994).

³⁵ See, e.g., *In re* Improving Public Safety in the 800 MHz Band, *Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order*, 19 FCC Rcd. 14969 (2004).

³⁶ See, e.g., STERLING & KITTROSS, *supra* note 22, at 249-53 (describing the multi-year move of FM from 42-50 MHz to its present location).

³⁷ See generally Amendment to the Commission’s Rules Regarding a Plan for Sharing the Costs of Microwave Relocation, *Notice of Proposed Rulemaking*, 11 FCC Rcd. 1923 (1995).

³⁸ See, e.g., 47 C.F.R. §15.323(b) (2003) (spectrum etiquette for unlicensed personal communications devices).

³⁹ DAN B. DOBBS, *THE LAW OF TORTS*, §463 at 1321-23, §465 at 1325-26 (West Group, 2000); HALL ET AL., *supra* note 20, at 258-59, 808.

⁴⁰ DOBBS, *supra* note 39, §463 at 1322.

decide which principle bears the most weight in each factual setting. Some of the key principles considered include the following:

1. Is the Interference Worth Government's Attention?

A first principle, which is used to screen out many trivial disputes, is that not all interferences, pertaining to land or spectrum use will be given redress. Residents of urban high-rise buildings must accept “the normal noises of everyday living,” such as “the patter of little feet overhead.”⁴¹ Only “excessive” or “deliberate” noise can be considered a nuisance.⁴²

In the same vein, the Commission does not guarantee spectrum licensees freedom from all interference. To merit the Commission’s remedial attention, interference to the complaining licensee must exceed some threshold.⁴³ To that end, the Commission often directs considerable attention to defining interference, developing such distinctions as “unreasonable,”⁴⁴ “unacceptable,”⁴⁵ or “harmful” interference.⁴⁶

2. Which Use Was First?

Assuming that the interference complained of is at least the minimum that the courts or the Commission will recognize, the arguments on the merits begin. The single strongest argument supporting a party to an interference

⁴¹ See, e.g., *La. Leasing Co. v. Sokolow*, 266 N.Y.S.2d 447, 448 (1966).

⁴² *Id.* at 450.

⁴³ See, e.g., *In re* Amendment of Parts 21 & 74 of the Comm’n’s Rules With Regard to Licensing in the Multipoint Distribution Serv. and in the Instructional Television Fixed Serv. for the Gulf of Mexico, *Notice of Proposed Rulemaking*, 17 FCC Rcd. 8446, para. 11 (2002) [hereinafter *In re* Amendment of Parts 21 & 74]; *In re* Flexibility for Delivery of Communications by Mobile Satellite Serv. Providers in the 2 GHz Band, the L Band and the 1.6/2.4 GHz Bands, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd. 1962, para. 111 (2003) [hereinafter *In re* Flexibility for Delivery of Communications by Mobile Satellite Serv. Providers]; *In re* Richtec Inc., 18 FCC Rcd. 3295, para. 17 (2003) [hereinafter *In re* Richtec].

⁴⁴ *In re* Amendment of Parts 21 & 74, *supra* note 43, at para. 11 (“[W]ith respect to . . . concerns about land-based [licensees] receiving potential unreasonable interference from any Gulf system(s), we address these concerns [below] . . .”).

⁴⁵ *In re* Flexibility for Delivery of Communications by Mobile Satellite Serv. Providers, *supra* note 43, at para. 111 (setting a standard of preventing “unacceptable interference” by satellite receiver noise to certain satellite operations in adjacent channels).

⁴⁶ *In re* Richtec, *supra* note 43, at para. 17 (“Richtec shall not cause harmful interference to any other lawfully operating satellite or radio facility and shall cease operations upon notification of such interference.”); see also 47 C.F.R. §2.1 (2003) (defining “accepted interference,” “harmful interference,” and “permissible interference”). Several FCC rules contain interference limits for different services. See, e.g., 47 C.F.R. §§24.238 (for broadband Personal Communications Services), 90.307 (for Safety and Special Radio Services).

dispute is that its use came first in time and that the other party knew, or should have known, of such use. For instance, homeowners won a nuisance case against neighbors who stopped using their land to grow wheat and began using it to raise thousands of hogs with the predictable waste and odor.⁴⁷

The Commission may take a similar approach in disputes between two radio licensees operating in the same geographic area, when the latecomer interferes with the first licensee's operation. An example of the Commission's application of this principle is the case of licensees for mobile telephone services operating atop the Peachtree Plaza Hotel in Atlanta, Georgia.⁴⁸ A newly licensed television transmitter placed atop the hotel unexpectedly caused interference to many mobile telephone operators who used adjacent frequencies and had been in the area for many years.⁴⁹ The Commission required the television broadcaster, who was the latecomer, to compensate the established land mobile licensees.⁵⁰

3. Which Use Is More Valuable?

The second most powerful argument supporting a party to an interference dispute is that its use is more socially beneficial.⁵¹ The more the interfering use serves a social or economic good, the more likely it will be allowed by the law and the Commission.⁵² Thus, a cement factory that causes pollution to a modest number of neighboring homes may be allowed to continue in existence if it is a major source of investment and employment in the community.⁵³ Social utility can even trump the "first use" principle in some cases. Thus, in a county that was once agricultural but has become primarily residential, the last farmer can be declared a nuisance and required to move his foul-smelling and insect-ridden operations.⁵⁴ Such a result promotes economic development and benefits a larger number of residents. The hog operation mentioned above

⁴⁷ *Weinhold v. Wolff*, 555 N.W.2d 454, 460 (Iowa 1996) ("Here the Weinholds acquired their farm before the Wolffs started their hog feeding and confinement operation. The Weinholds therefore clearly enjoyed priority of possession."); DOBBS, *supra* note 34, §465, at 1327, 1327 n.12.

⁴⁸ *Broad. Corp. of Ga. (WVEU-TV) Atlanta, Ga., Memorandum Opinion and Order*, 96 F.C.C.2d 901, para. 21 (1984) ("WVEU, as the 'newcomer', should be required to reimburse the land mobile radio licensees for their expenses in modifying their facilities to new frequencies.").

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ We hasten to add that which of two uses of a resource is more socially useful may be largely in the eye of the beholder.

⁵² DOBBS, *supra* note 39, §465, at 1329-30.

⁵³ *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870 (1970).

⁵⁴ *Spur Indus., Inc. v. Del E. Webb Dev. Co.*, 494 P.2d 700 (Ariz. 1972).

might have prevailed if it had cost millions to construct and had been a major source of employment for the community.

Likewise with the radio spectrum, greater social utility, even by a latecomer, can force an early user of less value to move or be silenced. Radio stations with few listeners were required to make way for those which the Commission thought would attract many listeners;⁵⁵ an early FM network was effectively put out of existence, and hundreds of thousands of radios were made useless, to make way for television.⁵⁶ In 1970, much-needed mobile, especially cellular, service won spectrum away from the few UHF stations that had been on the air since 1952,⁵⁷ and the Bell System's ability to deploy cellular mobile service across the whole nation quickly won it half the original cellular licenses over antitrust objections that such an award would prevent cellular service from competing with the last monopoly in telecommunications, Bell's own wireline telephone service.⁵⁸ A fascinating parallel at the Commission to "the last farmer" nuisance cases is the continuing litigation being pursued by radio astronomy operations in once-uninhabited areas seeking protection from radio transmissions that accompany suburban development, such as certain medical devices and television.⁵⁹

4. Assuming That Some Change Must Occur, Which Solution Will Cost The Least?

In the case described above of the cement factory that provided local investment and employment, the factory was allowed to continue in operation

⁵⁵ A NATION TRANSFORMED BY INFORMATION: HOW INFORMATION HAS SHAPED THE UNITED STATES FROM COLONIAL TIMES TO THE PRESENT 147-48 (Alfred D. Chandler, Jr. & James W. Cortada, eds., Oxford University Press 2000); cf. STERLING & KITROSS, *supra* note 22, at 115, 122-23.

⁵⁶ ERIK BARNOUW, *The Golden Web: A History of Broadcasting in the United States*, Vol. II – 1933 to 1953, 130, 242 (Oxford University Press, 1968); ROBERT L. HILLIARD & MICHAEL C. KEITH, *The Broadcast Century and Beyond: A Biography of American Broadcasting* 105-06 (2001); STERLING & KITROSS, *supra* note 22, at 156-60, 276-77.

⁵⁷ *In re An Inquiry Relative to Future Use of the Frequency Band 806-960 MHz; and Amendment of Parts 2, 18, 21, 73, 74, 89, 91, and 93 of the Rules Relative to Operations in the Land Mobile Service Between 806 and 960 MHz*, *Report and Order*, 19 R.R.2d (P&F) 1663, 1667, para. 13 (1970).

⁵⁸ *In re An Inquiry into the Use of the Bands 825-845 MHz & 870-890 MHz for Cellular Communications Sys.; and Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Sys.*, *Report and Order*, 86 F.C.C.2d 469, paras. 27-47 (1981).

⁵⁹ *See, e.g.*, Amendment of the Commission's Rules to Establish a Radio Astronomy Coordination Zone in Puerto Rico, *Memorandum Opinion and Order*, 13 FCC Red. 13683 (1998).

but was required to pay damages.⁶⁰ The sum of those damages, \$185 thousand, was less than the \$45 million investment in the cement factory and the 300 jobs that would be obliterated by an injunction closing down the operation.⁶¹

Similar minimization of costs can be found in Commission decisions resolving interference disputes. In the above-mentioned case of the new television transmitter that interfered with established mobile receivers atop a building in Atlanta, the Commission first ordered the television transmitter to use filters, modify its transmitter, and shield the mobile receivers.⁶² That spared each party the relatively high cost of moving to a new place or changing frequencies, but it did not end the interference. The Commission then required the next least costly remedy, namely requiring the television station to pay the cost of the mobile operations moving to other frequencies.⁶³

III. WHAT IS TO BE DONE?

Radio spectrum and private property are remarkably alike. The rules that govern their use are also remarkably alike, despite the rhetoric about “The People’s Airwaves” versus “Property Rights.” Of these two visions, property rights likely is the better one, for the same reasons that free markets have proven superior to centralized planning over the last hundred years. We take the position that the incentives inherent in a model granting rights such as exclusivity and transferability in the use of resources tend to lead to efficient use of those resources. Thus, to the extent that land law better defines, protects, and enables these rights compared to spectrum law, the latter needs reform.

Of course, as described above, both land and spectrum law impose limitations on use. To the extent these limitations address harmful interference to other users with similar rights, such rules should be economically efficient. More generally, effective limitations on use should produce more social gains than losses. Not all limitations can pass such a test, however, and some limitations cause potentially large net social losses. For example, a UHF TV licensee may not use the licensed spectrum for cellular service. A 1992 study by the Commission estimated that in the Los Angeles market alone, removing this restriction and allowing spectrum to move to a higher valued use, such as

⁶⁰ *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870, 873 (N.Y. 1970); *see also* *Spur Indus. Inc. v. Del E. Webb Dev. Co.*, 494 P.2d 700, 708 (Ariz. 1992) (requiring that suburbanites pay relocation costs of “the last farm”).

⁶¹ *Id.* at 873.

⁶² *In re* Resolution of Interference between UHF channels 14 and 69 and Adjacent-channel Land Mobile Operations, *Notice of Proposed Rulemaking/Notice of Inquiry*, 2 FCC Red. 7328, 7328-29 (1987).

⁶³ *Id.*

cellular service, would have produced a net social gain of over \$1 billion for the time from 1992 until 2000.⁶⁴

The challenge, therefore, is for the Commission and Congress to produce reforms that result in net social gains. The Commission, for its part, can achieve significant increases in net social welfare through regulatory reform. In one case, it recently decided that it had the authority to allow certain wireless radio licensees to trade spectrum usage rights in secondary markets.⁶⁵ For example, it granted this authority to commercial mobile radio and private mobile radio licensees.⁶⁶ To further reform at this level, the Commission should seek to apply the principles of property law. New allocations of spectrum should be given considerably more flexibility, while existing allocations should be reviewed to see if additional rights can be given to incumbent or other users.

As already noted, applying the principles of property law will not be simple. Land law includes many forms of ownership, leases, zoning, easements, rights-of-way, and eminent domain. It also changes to account for new technologies. For example, for centuries the ownership of land included the air “up to the heavens.” When aircrafts began flying early in the 1900s, land law changed to say that overflights, most of the time, were neither a trespass nor a nuisance.⁶⁷ Property rights in spectrum might also draw on the laws about movement of vessels on water – a resource that is not owned but in which “rules of the road” allow use by many and mechanisms for efficient use address scarcity where it exists.⁶⁸

Congress can also provide significant increases in net social welfare through legislative reform of spectrum law. For example, Congress authorized the Commission to auction spectrum in 1993, thus creating a more efficient way to move this resource to its highest valued use.⁶⁹ Future reform should make

⁶⁴ EVAN R. KWEREL & JOHN R. WILLIAMS, FCC, OFFICE OF PLANS & POLICY, CHANGING CHANNELS: VOLUNTARY REALLOCATION OF UHF TELEVISION SPECTRUM, WORKING PAPER NO. 27, 1992, at http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp27.pdf (last visited Dec. 30, 2003).

⁶⁵ *In re* Implementation of Sections 309(j) and 337 of the Communications Act of 1934, as Amended: Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies, *Second Report and Order and Second Further Notice of Proposed Rulemaking*, 18 FCC Rcd. 3034 (2003).

⁶⁶ *Id.*

⁶⁷ DOBBS, *supra* note 39, §54, at 108-10.

⁶⁸ For example, while the open seas have considerable space and thus the ability to accommodate virtually all users who obey the rules of the road, harbors and high-traffic waterways must by necessity establish mechanisms, such as docking fees, to efficiently allocate their more scarce operating waters. Where the resources – shipping lanes, specific spectrum bands, etc. – are scarce, property-like mechanisms may be necessary for efficient use.

⁶⁹ 47 U.S.C. §309(j) (2000).

rights to spectrum more property-like, authorizing the Commission to follow the model of land and other forms of property law in prosperous, economically developed countries, especially the United States. Other useful reforms might be to replace the statutory standard for regulatory action (“the public interest, convenience, and necessity”) with something more narrow and less subject to political and social pressure, such as “productivity” or “efficiency.”⁷⁰ Care should be taken, however, to avoid substituting one arbitrary standard for another. A more dramatic but potentially useful reform would be to transition more of the responsibility for resolving disputes to courts, in effect eliminating a major role of regulators.⁷¹ As noted above, this role has been played by the Commission throughout its history with some success. Yet assigning to courts the responsibility of resolving disputes would help focus each branch of government on its comparative advantage, in addition to making what would likely be an efficiency-creating move towards a more property-like arrangement.

Perhaps the only reason that spectrum has lacked these improvements is historical, that it was discovered, exploited, and became important in approximately twenty years. It thus provoked more awe and fear than reasoned comparison to other resources for which bodies of law already existed.⁷² If so, then we may be in spectrum law where land law was 100 years after the Norman Conquest, and it’s catch-up time. While regulatory reforms by the Commission may help considerably, comprehensive catch-up is almost certainly impossible without legislative reform and, thus, action by Congress.

At the same time, visions must meet real needs and must allow for exceptions. Just as this country zones land and leaves much of it in government hands for military activities and parks,⁷³ even a property rights system may need to leave much spectrum under non-market control. Also, disruptive new technologies such as Ultra Wideband,⁷⁴ if their promoters’

⁷⁰ Cf. William H. Read & Ronald Alan Weiner, *FCC Reform: Governing Requires a New Standard*, 49 FED. COMM. L.J. 289 (1997) (proposing a pro-competitive antitrust standard).

⁷¹ Thomas W. Hazlett, *The Wireless Craze, the Unlimited Bandwidth Myth, the Spectrum Auction Faux Pas, and the Punchline to Ronald Coase’s “Big Joke”*: An Essay on Airwave Allocation Policy, 14 HARV. J.L. & TECH. 335, 405 (2001).

⁷² BRUCE M. OWEN ET AL., TELEVISION ECONOMICS 13 (Lexington Books, 1974).

⁷³ We realize that private owners of land can create efficient parks also, such as Disney World and Six Flags.

⁷⁴ Ultra-wideband is a technology that uses very narrow or short duration pulses that result in very large, or wideband, transmission bandwidths. UWB can use spectrum occupied by other radio services without causing significant interference, thus enabling more communication on a finite amount of spectrum than was possible before. See, e.g., *In re Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems*, Memorandum Opinion and Order and Further Notice of Proposed Rule Making, 18

claims prove to be true, may make it easier to establish spectrum “parks” or commons. These will enable vast private use with government merely regulating behavior as it does with “Keep off the Grass” signs in parks.⁷⁵ On the other hand, private parties may use these new technologies to make spectrum available to even more users, perhaps in innovative ways, which in turn may lessen the need for government commons.⁷⁶ The Commission’s recent effort to promote the development of “private” commons is an important step in this direction and reflects an understanding of the ways in which new uses and technologies challenge traditionally rigid models of spectrum regulation.⁷⁷

At a more general yet prominent level, the President’s Spectrum Policy Initiative (“Report”) trumpets efficiency as a primary goal.⁷⁸ While the Report also sees a role for non-market treatment of spectrum in some cases, this is not inconsistent with the argument made above. Rather, if pursued faithfully, it will move spectrum away from government planning and towards more property rights, while also retaining commons in specific circumstances.

IV. CONCLUSION

In short, there is significant need for reform, but there also is cause for optimism. The Commission’s implementation of spectrum regulations has been better (i.e., closer to the efficiency of a system of property rights and common law courts) than property rights advocates may admit.⁷⁹ At the same time, the opportunity for improvement (i.e., making further efficiency gains) is greater than defenders of the status quo may admit. We call for “bold, persistent experimentation”⁸⁰ in the spectrum with property rights and, where

FCC Rcd. 3857, paras. 3-4 (2003); *see also* Multispectral Solutions Inc., at <http://www.multispectral.com/history.html> (last visited Nov. 19, 2004).

⁷⁵ *See generally* Yochai Benkler, *Some Economics of Wireless Communications*, 16 HARV. J.L. & TECH. 25 (2002); *see also* Werbach, *supra* note 3.

⁷⁶ *See generally* Benjamin, *supra* note 8.

⁷⁷ FCC News, *FCC Expands Spectrum Leasing Rules & Speeds Processing to Create Additional Opportunities for Access to Spectrum Through Secondary Markets*, (Ret. No. 04-167), Dkt. No. 00-230, at http://hraunfoss.fcc.gov/edocs_public/attachmatch/Doc-249427A1.pdf (July 8, 2004).

⁷⁸ U.S. DEP’T OF COMMERCE, SPECTRUM POLICY FOR THE 21ST CENTURY – THE PRESIDENT’S SPECTRUM POLICY INITIATIVE: REPORT 1, RECOMMENDATIONS OF THE FEDERAL GOVERNMENT SPECTRUM TASK FORCE 4-6, 27 (2004), at http://www.ntia.doc.gov/reports/specpolini/presspecpolini_report1_06242004.htm (last visited July 29, 2004). The Report also sees a role for non-market treatment of spectrum in some cases, too. *Id.* at 27.

⁷⁹ Indeed, property rights as they pertain to land use continue to be hotly debated in some contexts, such as how they relate to environmental concerns.

⁸⁰ Address of Gov. Franklin D. Roosevelt, Oglethorpe University, May 22, 1932, *Works*

appropriate, commons. Perhaps due to inflexible law and regulation, radio spectrum brought only three channels of TV to the United States, but cable TV and telephone wires brought hundreds of channels and billions of web pages. With more efficient law and regulation, speedily implemented, the radio spectrum can spawn the next billion-fold improvement for American consumers.