The Business of Broadband and the Public Interest:

Media Policy for the Network Society

by

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ABSTRACT

Media policy in the United States has, since its inception, been governed by the principle that infrastructure providers should serve "the public interest." The Federal Communications Commission has traditionally been charged with enforcing various obligations on businesses under this principle. Policymakers have developed different regimes for different media, but these distinctions no longer make sense in a technologically converged environment.

This study draws upon the historical origins of the principle in order to inform contemporary debates in communication policy. It recovers some of the normative meaning behind "the public interest" phrase, and identifies the several dimensions in which it remains relevant today. The thesis argues that universal access, platform innovation, and general-purpose technologies should inform network-aware media policy.

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INTRODUCTION

There is something special about communication. There is something about communication that propels it beyond just the domain of hallowed private enterprise and into the domain of public interest. At least, that is the theme of several hundred years of governance. Perhaps it is no longer true.

The contours of "the public interest" have never been cleanly delineated, and they have been even less consistently articulated. Nevertheless, there is a principle, originating in English common law and persisting in current American statute, that "businesses affected with the public interest" take on certain social responsibilities enforceable by the law. Lord Hale most famously articulated this idea in a seventeenth-century tract, explaining that certain types of private property can become "affected with a public interest, and they cease to be *juris privati* only."[1] He noted that a variety of businesses have rightfully been viewed in this way—including wharves, inns, and bridges.

Something special about these businesses in particular caused courts to superimpose a degree of public jurisdiction over private enterprise. Some have described how examples to date include an element of common calling—that they in some way "hold out" service to the public at large.[2] Many of these services became known as "common carriers," in a distinction that persists today. Other scholars have discussed how these special businesses all exhibit a degree of potential monopoly control, acting as

[1] Sir Matthew Hale, *De Portibus Maris*, reprinted in *A Collection of Tracts Relative to the Law of England*, ed. Francis Hargrave (London, 1787) 78.

[2] Joseph W. Singer, "No Right to Exclude: Public Accommodations and Private Property," *Northwestern University Law Review* 90 (1996): 1304-1321; Charles K. Burdick, "The Origin of the Peculiar Duties of Public Service Companies, Part I," *Columbia Law Review* 11.6 (June 1911): 514-531.

exclusive gatekeepers that suppress competition.[3] Both lines of analysis seem persuasive in part. However, as I will discuss, the historical examples also resist those attempts to nail them down.

Despite this difficulty of definition, American communications law places the public interest at its core. The phrase appears nearly a hundred times in the current version of the Communications Act. When the Federal Communications Commission promulgates rules, its orders are peppered with references to the public interest. Indeed, the ultimate backstop from Congress is that the FCC must justify all rules as serving the public interest – whether they apply to copper wires, wireless, cable, or otherwise. Public interest obligations developed in the US for physical transportation by railroad have been translated into virtual transportation of communication.

The challenge for regulators, innovators, and citizens is to understand what this all means in the context of an ever-convergent communications landscape. Regulators can make mistakes both when they overbear and when they forbear. Innovators can be stifled by ill-conceived restrictions in the name of public interest and can equally be blocked by ill-intentioned competitors. Citizens can miss their participatory potential in a consumption-focused environment and a read-only mentality. A rich sense of the public interest requires understanding its well-worn history as well as the unique affordances of our burgeoning network society.

Over the last century, the public interest has justified a variety of specific policies. The earliest radio regulations focused on public safety and required operators aboard ships to ensure effective emergency communication. As broadcasters began to interfere

[3] Bruce Wyman, "The Law of Public Callings as a Solution of the Trust Problem," *Harvard Law Review* 17.3 (1904): 156-173.

with each other's signals, the government stepped in to issue exclusive operating licenses in exchange for somewhat arbitrary demonstration of valuable public service. This model of licensing in exchange for trusteeship was used to promote various goals through the 1960's, including diversity of programming, localism, political discourse, children's programming, limits on advertising, and more.[4] Meanwhile, wireline regulation developed its own set of public interest guidelines. These included the idea that carriers may not discriminate between communication sources, they should serve (or "build out" to) all citizens, they must interconnect with other carriers, and their prices must be government-controlled to avoid over-charging in the monopoly environment. Over time, some of these principles were de-emphasized in favor of a focus on generating more robust competition and efficient use of scarce resources. Clearly, contemporary policy cannot simultaneously embody all of these historical principles to the same degree.

The internet offers a fresh opportunity to consider the relevance of the public interest in communication policy. It presents a moment of media change in which we must reformulate the government's role in defining and promoting a public interest standard. In this sense, it is a moment of technological transition that mirrors the electrification of communication, the invention of broadcasting, and the proliferation of cable. Early regulators struggled to describe what it was that imbued radio waves and telegraph wires with public significance. The internet operates using the infrastructure of some of these technologies, but it also transforms the ways they are used. Both copper and coax provide telephone, video, and web service through a unified Internet Protocol. Wireless and fiber fill out different extremes of the broadband speed spectrum. By some

[4] For a comprehensive review of this history, see Erwin Krasnow, "The 'Public Interest' Standard: The Elusive Search for the Holy Grail," *Federal Communications Law Journal* 50.3 (1998): 605-635.

measures, competition and convergence have brought us into an age of boundless abundance.[5] By other measures, we are still a far cry from a universal virtual agora, and the forces of control threaten the public benefits we are just beginning to realize.

One theme that stands out in this centuries-old debate is worth noting up front. The public interest in transportation and communication has never been entirely about markets and competition. To be sure, this has been part of the debate. Nevertheless, commentators have long strived to describe something more. The public interest doctrine in American law grew up in parallel with antitrust law, and at times the two became intertwined.[6] Even in the early "public interest" articulation in the 1876 case, *Munn v. Illinois,*[7] discussion of "virtual monopoly" crept into the analysis. I aim to highlight the more elusive and social side of public interest regulation while also refining its economically grounded rationales.

In recent years, many have declared the end of the public interest standard, or at least the death of its justifications. They often take aim at the public interest standard as it appears in broadcast regulation, claiming that it was doomed from the start. Ronald J. Krotozynski, Jr., remarks, "The sad truth . . . is that the Commission's attempts to implement the public interest standard . . . are a portrait of regulatory failure, notwithstanding the good faith efforts of virtually every subsequent Chairman of the Commission."[8] Right-leaning free-market advocates like Adam Thierer argue for a zero-

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[5] See, for example, United States, Depart. of Commerce, "Networked Nation: Broadband in America 2007 National Telecommunications and Information Administration" (Washington: GPO, 2008), Available at: <http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf>.

[6] Willie A. Grieve and Stanford L. Levin, "Common Carriers, Public Utilities and Competition," *Industrial and Corporate Change* 5.4 (New York: Oxford UP, 1996) 993-1011.

[7] *Munn v. Illinois*, 94 U.S. 113, 1876.

[8] Ronald J. Krotoszynski, Jr., "The Inevitable Wasteland: Why the Public Trustee Model of Broadcast

touch policy, reasoning that "The public interest standard is not really a 'standard' at all since it has no fixed meaning; the definition of the phrase has shifted with the political winds to suit the whims of those in power at any given time."[9] Thomas Streeter claims that from the perspective of left-leaning Critical Legal Studies, the term is wrought with "legal indeterminacy" and that "any assertion of the social good or the 'public interest' necessarily involves what we ordinarily think of as 'subjective' contingency and variability."[10] Conservative libertarians and liberal progressives agree: broadcast-era public interest regulation is highly problematic. Although many of these critiques are persuasive, it is not clear that they carry much force in the context of the internet. To begin with, the idea of regulating in the "public interest" originated long before broadcast media.[11] Furthermore, the internet presents a new cultural configurations and new modes of communication. These may well bring new public interest considerations.

Our current media ecology is radically affected by the introduction of the internet. The outcome of this disruptive force depends on the interaction of markets, norms, architecture, and law.[12] If there is anything worth preserving or adapting from the legacy of public interest communication regulation, it must be considered in the light of how

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Television Regulation Must Fail," *Michigan Law Review* 95.6 (May 1997): 2103-2138.

[9] Adam Thierer, *Media Myths: Making Sense of the Debate over Media Ownership* (Washington, DC: The Progress & Freedom Foundation, 2005) 100 <http://www.pff.org/issues-pubs/books/050610mediamyths.pdf>.

[10] Thomas Streeter, "Beyond Freedom of Speech and the Public Interest: The Relevance of Critical Legal Studies to Communications Policy," *Journal of Communication* 40.2 (June 1990): 48.

[11] William D. Rowland, Jr., "The Meaning of 'The Public Interest' in Communications Policy, Part I: Its Origins in State and Federal Regulation," *Communication Law & Policy* 2.3 (1997): 309-328. Rowland explains that not only did the public interest standard have a far more well-established meaning than most commentators claim, but it also bore the lineage of centuries of non-discriminatory rules. The broadcast twist (or perversion, depending on one's perspective) "was a well-rehearsed doctrine, with a rather widely understood practical meaning that had been emerging throughout the earlier stages of American industrial regulation" (p. 315).

[12] I of course owe these distinctions to Lawrence Lessig, *Code* (New York: Basic Books, 2006).

these forces regulate the overall environment. The outcome does not depend only on governmental regulation or economic forces but on their interactions with each other and with cultural and institutional forces. Right now is a critical point of media in transition that will affect the shape communications ecosystem going forward. As Paul Starr notes, "At times of decision—constitutive moments, if you will—ideas and culture compel into play, as do constellations of power, preexisting institutional legacies, and models from other countries."[13] This is now one such moment.

Broadly, there are three fundamental questions that I seek to address in this paper. First, should the elusive notion of "the public interest" have any relevance whatsoever in current communications policy? Second, how does the medium of the internet connect to and transform the media-specific public interest implementations of the past? Third, how do the cultural norms of the internet inform core public interest principles in contemporary policy debates?

In Part I, I sketch the historical development of the public interest standard from medieval common law to the present. This includes its first appearance in constitutional law stateside, as well as the roundabout way it was incorporated into the Communications Act. I touch on early articulations in broadcast radio, and then television, as the FCC established various requirements for use of the "public airwaves" and the "common carriers." I describe how technological advance provided more frequencies for use and more "pipes" into the home, which in turn was used to justify a deregulatory market-based approach in the second half of the century. The internet experience provides a novel and remarkably successful model, with decentralized agents interconnecting under

[13] Paul Starr, *The Creation of the Media: Political Origins of Modern Communications* (New York: Basic Books, 2004) 2.

an ethos of openness. The internet is simultaneously exceptional and dependant upon old technologies, norms, markets, and law. I ask whether it offers an opportunity to constructively update our notions of the public interest.

In Part II, I outline several contemporary regulatory debates about broadband policy, with the hope of bringing public interest considerations to bear. Scholars, policymakers, and engineers have recently been having heated arguments about whether and when content discrimination might be appropriate in the network. This includes what has been called "network neutrality,"[14] as well as various types of "network management" that can optimize scarce bandwidth but also place speech-dampening power in the hands of commercial gatekeepers. A similar set of questions arises in the area of spectrum allocation. In this case, the FCC must choose which entities have a right to use valuable frequencies for new broadband services, and under what terms. The Commission has embraced both auctions and unlicensed use and continues to experiment with different models in the name of the public interest. Finally, I describe the current discourse around a possible "national broadband strategy." Many have called for a comprehensive approach to national broadband deployment that is informed by other countries, but the US faces a paucity of data about existing deployment as well as a lagging political will to take substantial action other than deregulation.

In Part III, I describe some preliminary principles of public interest that are informed by the internet experience. While these focus primarily on broadband policy, they are designed to be ubiquitously relevant in an increasingly IP-based, technologically

[14]Tim Wu, "Why Have a Telecommunications Law?: Anti-Discrimination Norms in Communications," *Journal on Telecommunications and High Technology Law* 5.1 (2006): 15-46; Tim Wu, "Network Neutrality, Broadband Discrimination," *Journal on Telecommunications and High Technology Law* 2 (2003): 141-179.

converged media landscape. I first discuss how we need to move from the legacy notion of "universal service" and its politically co-opted bureaucracy to an approach that emphasizes unitary and universal access. Many-to-many access, not one-to-many service, needs to be at the heart of our understanding of publicly valuable communication. Furthermore, this access needs to be unitary in the sense that access at any point implies equal access to the whole network. Second, I discuss how we need to move from purely static competition analysis to a more holistic dynamic innovation perspective. This involves recognizing the disadvantages of concentrating control of communication, even in the hands of rational market actors. Such a shift understands that radical economic growth comes endogenously from the network. This necessitates a re-envisioning of traditional competition law. Finally, I explain that controlled-use communication technologies must give way to general-purpose platforms. Such an approach places innovative and expressive power in the hands of users (citizens) and enables emergence of remarkable new modes of production and creation.

I. THE HISTORY OF BUSINESSES AND THE PUBLIC INTEREST

In 1930, two accomplished legal scholars offered interpretations of what it meant to be "businesses affected with the public interest." In the pages of the *Harvard Law Review* and the *Yale Law Journal*, respectively, they laid out justifications for governmental regulation in the public interest. Breck P. McAllister explained that the concept historically focused on the type of the business at hand.[15] On his telling,

[15] Breck P. McAllister, "Lord Hale and Business Affected with a Public Interest," *Harvard Law Review*, 43.5 (March 1930): 759-791.

transportation-related businesses most frequently triggered public interest obligations, especially when they were offered to all. McAllister's former professor Walton H. Hamilton responded that what really mattered now was whether the business had a degree of monopoly control. He conceded McAllister's telling of history, but explained that the shifting meaning was simply the common judicial practice of "putting new wine in old bottles." The living law changes, he explained. Common sense and judicial opinion now stated that "whenever enterprise ceases to be free, therefore, the matter becomes of public importance."[16] In short, McAllister thought that public interest had historically been applied based on the nature of the business, whereas Hamilton thought it should now be based on competition analysis. McAllister indicated that the historical justifications may be outmoded, and Hamilton insisted that economic analysis should become the exclusive criteria for interventions.

This was not simply an abstract discussion amongst theorists. In the early twentieth century, legislators and policymakers were trying to understand their public-oriented mandates in the context of a raft of new laws and regulatory agencies. The Interstate Commerce Commission had been established to regulate railroads (and then telegraph and telephone), and parts of its mission sounded remarkably similar to those of the newly created Federal Radio Commission. Antitrust legislation was being updated, and the "trust busting" movement was in full swing. The language of "public" airwaves, rights-of-way, and trusteeship intermingled with the debate over how to protect against powerful industrialists. Deciding how the government should regulate such businesses

[16] Walton H. Hamilton, "Affectation with Public Interest," *Yale Law Journal* 39.8 (June, 1930): 1107.

involved wrestling with the somewhat competing definitions of "public interest" presented by thinkers like McAllister and Hamilton.

A. EARLY FORMULATIONS[17]

1. Common Law

Behind the debate stood centuries of common law. David Bogen has traced the legal notion of a "public calling" for innkeepers.[18] As early as the fourteenth century it was customary to accept any traveler, but the legal requirement to do so was not well established until the seventeenth century. There was a sense of overall public interest in ensuring that travelers would be housed fairly and safely, not turned out into the night. Eventually the law established that if a bed was available the innkeeper could not pick and choose his patrons. Similar "public calling" obligations required blacksmiths to shoe horses in a damage-free, non-discriminatory fashion.[19] Bogen explains that in a key 1624 resolution of the court, "Justice Chamberlaine noted that simply by putting up a sign and lodging travelers, an individual became liable to an action on the case for refusing someone shelter."[20] As custom became common law, the detailed reasons for public calling obligations on these particular businesses were never worked out in detail.

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[17] I should note at the outset that Thomas Nachbar's work immeasurably informed this section and indeed was my inspiration for delving more deeply into the history of these precedents; see Thomas Nachbar, "The Public Network," March 2008 Working Draft, *CommLaw Conspectus* (Dec. 2008), pending <http://ssrn.com/abstract=1009641>.

[18] David S. Bogen, "The Innkeeper's Tale: The Legal Development of a Public Calling," *Utah Law Review* 51 (1996): 51-92. Bogen's thesis is that the requirement to serve evolved largely because it was necessary to support the enforcement of liability on innkeepers for the guests they had accepted. If innkeepers were to be made to assume responsibility for their guests' safety and property, they must not be able to turn guests away simply for demanding that protection. Thus, Bogen argues that although non-discriminatory service eventually became assumed in its own right (and innkeeper liability faded), the principle evolved in an indirect way that allowed it to take hold without more explicit articulation of its justifications.

[19] *Lane v. Cotton*, 88 , Eng. Rep.1458 (K.B. 1701).

[20] Bogen 88, cited as "Resolutions Concerning Innes, 123 Eng. Rep. 1129 (1624)."

Meanwhile, another class of businesses was also being described in terms of the public interest—transportation carriers. A touchstone from English law has been jurist Matthew Hale's 1670 description of port facilities, bridges, ferries, and the like as being private businesses that are nonetheless "affected with the public interest."[21] Hale explained that in the case of ferries, a person may set up a ferry for private and exclusive use, but if that service is offered generally to the public it becomes subject to public interest obligations. Likewise, port facilities, such as a public wharf "unto which all persons that come to that port must come and unlade or lade their goods,"[22] bear the responsibility to serve all, in equal fashion, under reasonable terms.[23] Implicit in the description of these businesses is consideration of the nature of the business (transportation infrastructure), whether or not it is offered to the general public ("held out"), and the state of competition for the service (whether "all persons that come to that port **must** come [emphasis mine]"[24] to that proprietor). As we shall see, these distinctions provide ample fodder for public interest regulation and debate through the present.

Common law continued to define which trades were subject to public interest obligations and which were not. Services that involved carrying goods became grouped under the term "common carrier," and businesses such as inns were often listed alongside these examples.[25] By the nineteenth century, other businesses that were thought to have

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[21] Hale 78.
[22] Hale 77.
[23] "I. They [ports] ought to be free and open for subjects and foreigners, to come and go with their merchandise. . . . 2. There ought to be no new tolls or charges imposed upon them without sufficient warrant, nor the old inhanced. . . . 3. They ought to be preserved from impediments and nuisances" (Hale 84).

[24] Hale,77,.
[25] For an extensive accounting of the history of this development, see William Jones, "The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective," appendix to the Reply

been "held out" to the general public, such as the "common" tailor and surgeon, clearly did not bear the duty to serve.[26] Oliver Wendell Holmes noted in 1881 that applying non-discrimination requirements on all businesses would be "monstrous"[27] – presumably because to do so would compel service that infringed on practitioners' rights in cases where services were not critical to social well-being. The duty to practice with care was upheld across most business (via contract or tort), but the obligation to serve all comers non-discriminately survived only for a handful of practices. Innkeepers and common carriers became the quintessential examples.

The idea that a business can be affected with the public interest appears prominently in American law in the 1876 case of *Munn v. Illinois*.[28] In an era of increasing governmental oversight of industry, the courts were struggling with how to square these state interventions with the constitution. The case itself dealt with a series of grain warehouses on the harbor in Chicago, which served as a staging area for shipping via the Great Lakes. The court explained that the warehouses stand "in the very 'gateway of commerce,' and take toll from all who pass." The court considered the business to be of the same nature as common carriers, innkeepers and the like—citing Lord Hale at length and even going so far as to say that the proprietors exercised "a sort of public office." It noted that the owners of the various warehouses agreed on prices, and enjoyed a "virtual monopoly." Thus, *Munn v. Illinois* gives ample resources from which to build

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Comments of International Business Machines Corporation in Competitive Carriers Rulemaking, CC Docket No. 79-252 (filed 4 April 1980).

[26] Nachbar, 25.

[27] Oliver Wendell Holmes, *The Common Law* (Boston: Little Brown, 1881) 203.

[28] *Munn v. Illinois*.

a theory of public interest regulation based on public holding-out of service, market power, the nature of the business, or some combination of the three.[29]

2. Justifications and Obligations

Similar positions surface repeatedly in the public interest debate, and they are not mutually exclusive. The first school of thought, that obligations apply to businesses that "hold out" services to the public, goes back to the earliest attempts to enforce responsible innkeeping. Some scholars have extended this theory to explain why other types of "common" practitioners may have been subject to obligations to serve indiscriminately. Adherents to this approach claim that the various "common" trades by their name implied public interest obligations—that somehow being a "common cook" meant a person was conducting a general public service.[30] Other versions of this argument contend that particular businesses by their nature constitute a "holding out."

This "holding out" explanation has some allure. It is certainly true that business dealings between a private or limited group of entities would not trigger public interest obligations. On the other hand, there are innumerable businesses that have "held out" service to the public but not been subjected to the full range of public interest obligations. This would indicate that holding-out (explicitly or implicitly) is necessary but not sufficient to being "clothed in the public interest." If that is the case, there must be more to this standard.

[29] I am indebted to Nachbar for his articulation of these distinctions.

[30] See, for example, both Burdick and Singer.

One line of reasoning emphasized from *Munn v. Illinois* on is premised on monopoly control, or at least on undue market power.[31] If consumers do not have the choice that a competitive environment would provide, they are likely to be cheated or denied service. This monopoly control can come in the form of economic monopoly or government-granted monopoly. In an economic monopoly, the monopolist maintains exclusive control over a service or resource purely based on its own market power. Government-granted monopolies, on the other hand, typically take place under grant of franchise to the monopolist, which comes with conditions. Lord Hale's treatise clearly focused on port facilities, which in his time were almost always monopolies of some sort, and he acknowledged this. Commentators have claimed, sometimes with thin evidence, that most "public interest" businesses exercised market power.[32] *Munn v. Illinois* provides ample space for this argument in its "virtual monopoly" language.

Still, it is not clear that public interest obligations at common law were motivated primarily by market considerations. Certainly innkeepers were not always local monopolists.[33] The monopoly language in *Munn v. Illinois* may be incidental to the primary finding, and some have surmised that it was primarily a rhetorical device in an environment that was generally hostile to monopolists. Nachbar notes that "Although market power has frequently received prominent rhetorical placement in nondiscrimination regimes, market power has been neither a necessary nor a sufficient

[31] Hamilton believes that this factor may have been central to the majority's reasoning in *Munn v. Illinois*, but McAllister does not. In any event, it clearly became emphasized afterward.

[32] Wyman's central claim is that monopoly is the critical factor, but his article cites little evidence and instead relies on dubious assertions.

[33] "Resolutions Concerning Innes," 123 Eng. Rep. 1129 (1624).

condition for imposing nondiscriminatory access on an industry."[34] It may even have been "read into" the case after the fact more strongly than it was intended. It is no coincidence that the monopoly argument gained traction in an era of Progressivism and trust-busting. Antitrust law did not claim the same roots for its justification, but it nevertheless became intermingled with transportation and communications regulation. The 1912 *United States v. Terminal Railroad Association* decision mandated access to "essential facilities" based on its antitrust grounding.[35] Different degrees of market-oriented oversight led to different degrees of government intervention. The monopoly language provided no hard and fast distinctions, and some have argued that it led overseers to assume that private interests always aligned with public interests.[36]

If neither "holding out" nor monopoly control alone determine which businesses are affected with the public interest, perhaps we should look to the nature of the businesses involved. This third approach is more subjective, but also potentially more productive. There are some striking commonalities between the businesses that have been placed in this special category. To be sure, some of this is due purely to the self-reinforcing nature of the law—history tends to be perpetuated. However, Thomas Nachbar makes a strong case that most of these businesses have to do with *transportation*

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[34] Nachbar 61.

[35] *United States v. Terminal Railroad Association*, 224 U.S. 383 (1912) and 236 U.S. 194 (1915); the "essential facilities" language was not in fact used in the case, but rather developed after the fact. The essential facilities doctrine has significantly fallen out of favor in recent years, and in *Verizon v. Trinko,* 540 U.S. 398 (2004*),* seems at risk of being banished entirely from telecommunications law.

[36] Willard D. Rowland, Jr., "The Meaning of 'The Public Interest' in Communications Policy Part II: Its Implementation in Early Broadcast Law and Regulation," *Communication Law & Policy* 2.4 (1997): 363-397. "During the century-long period before the enactment of broadcast radio law, the public interest standard came to be interpreted widely by administrative agencies and the courts as a doctrine to insure the economic well being of the regulated industries" (p. 364). Rowland notes that this view was supported by the utopian vision of a new class of "enlightened business man" and that Hoover's Radio Conferences typified this stance.

or communication infrastructure. This helps to explain why it was so natural for courts to translate regulations focused on exchange of *goods* into exchange of *expressions*. If this line of reasoning holds, then we must ask what it is about communication infrastructure that makes it different from other businesses. I argue that the distinction is indeed more fundamental than "holding out" or market power. Regardless, public interest justifications appear to fall into some combination of these three categories:

- *"holding out":* the provider has made an implied promise to serve
- *market power/"virtual monopoly":* little competition leads to market failure
- *special type of business:* transportation and communication are infrastructure

Ultimately, the dilemma of how to constitutionally justify state intervention was rendered moot in *Nebbia v. New York* (1934).[37] The government was granted broad power to regulate wherever it deemed necessary. Nevertheless, the core idea that communications infrastructure is unique continues to influence policymaking. In order to understand how to regulate, if at all, we need to understand why communication has been so valued that we have been willing to impose a degree of *juris publici* on private property.

Identifying the historical justifications for public interest obligations is only the first step. The second step is to explore the nature of the obligations themselves. Impositions on transportation and communication infrastructure have generally involved the requirement to serve everyone, and to do so equally. This was true of early innkeeping law, eighteenth century common carriers, and the telegraph. Serving everyone seems like a relatively straightforward requirement—either a business is doing

[37] *Nebbia v. New York*, 291 U.S. 502 (1934).

so or it is not. However, the ability to discriminate in the price, order served, or quality provided makes the problem considerably more complex.

Throughout much of history, this problem was dealt with through explicit price controls and requirements to serve all comers in the same fashion. Detailed price-setting was not foreign in medieval common law because the king routinely set prices for many types of goods. However, as centralized control relaxed – and especially as business grew in the United States amidst different public sentiments about governmental control – price-setting became less widespread. Near the turn of the twentieth century, transportation and communication companies grew to such size that they became national or regional monopolists, and the government had to confront the question of what to do in order to protect consumers and support the free exchange of ideas. This set off the series of regulatory reactions I outline in the next section. Even then, the transit of goods and information was largely a commodity service offered uniformly or, in the case of broadcast, a monopoly-granted license with content rules. It was not until the internet entered the picture that dilemmas around differentiated services, order of service, and quality of service came to the forefront.

3. The Roundabout Route into the Communications Act

As outlined above, the Supreme Court decision in *Munn v. Illinois* set the stage for federal regulation of transportation infrastructure. The fact that the grain elevators stood at the gateway of commerce, specifically *interstate* commerce, gave the federal government the toe-hold necessary to intervene. The social practice of equal service begat English common law, which in turn made its way into American case law. In

1887, the legislature created the first federal regulatory agency: The Interstate Commerce Commission (ICC).

The ICC was granted broad jurisdiction to regulate interstate commerce and was explicitly given a mandate to regulate the railroad business. Railroad companies had continued to grow in size, and there was increasing concern about their business practices.[38] Railroads had become critical to transportation of food and supported any number of other businesses. States had developed some limited regulatory structures. However, Congress had neither the railroad-specific expertise nor the ability to conduct close long-term scrutiny. The solution on the federal level was to create the ICC as an "expert" body with the power to promulgate detailed rules within the bounds of their broad authority. The Interstate Commerce Act declared, among other things, "That it shall be unlawful for any common carrier subject to the provisions of this act to make or give any undue or unreasonable preference or advantage to any particular person. . . ."[39] The common carriage principle became established in American transportation law at the same moment that the country embarked on its first experiment with a federal regulatory agency.

The Interstate Commerce Act would be amended many times in the years to come. There were several shortcomings from the perspective of Congress. For one, the Act did not give the Commission as much enforcement power as expected, which was being challenged in court. For another, other industries began to be seen as parallel to

[38] Bruce Wyman, "The Rise of the Interstate Commerce Commission," *Yale Law Journal* 24.7 (May 1915): 529-543.

[39] Interstate Commerce Act of 1887 (24 Stat. 379), approved 4 Feb. 1887, sec. 4.

railroads. Interstate pipelines were added to the agency's jurisdiction, as well as communications lines.

The 1910 Mann-Elkins Act outlined the ICC's jurisdiction over telephone, telegraph, and cable communications (whether wired or wireless). Some states had already exercised degrees of oversight over these industries. Congress decided that the federal agency could and should oversee the interstate portion of the businesses. The Act added communications carriers to the list of common carriers and included some specific exceptions for rate-discrimination based on customer-defined classes of service ("day, night, repeated, unrepeated, letter, commercial, press, Government, and such. . ."). [40] Apparently some members of Congress who focused on railroad policy expressed concern about incorporating this new industry into the bill, but the non-discrimination principles proved analogous enough that the new jurisdiction survived through passage.

That same year, Congress also saw fit to regulate wireless communication in the interest of public safety. In the Wireless Ship Act of 1910, it required all sea-faring vessels to have radio equipment and an operator on board. This time, it placed enforcement in the hands of the Commerce Department. However, amateurs and "professionals" often crossed paths on the air, with the amateurs occasionally annoying the others with their banter and the newcomers frustrating the amateurs with their poor Morse code skills. [41] By 1912 most commercial and navy vessels included a radio set and an operator for communicating with the shore and calling for help. The *Titanic* was one of these ships. When the boat collided with an iceberg on April 10, 1912, a series of

[40] Interstate Commerce Act of 1887 (24 Stat. 379), approved 4 Feb. 1887; amended 1913, section 8563.

[41] Susan J. Douglas, *Inventing American Broadcasting, 1899-1922* (Baltimore: Johns Hopkins UP, 1987) 212.

radio communication failures meant that rescue vessels missed calls for help and that messages incorrectly reported that all passengers had already been saved. There is a range of explanations for these failures—including the fact that nearby boats' radio operators were asleep rather than attending the radio set—but ultimately the amateurs were most aggressively blamed. It was perceived that they had a role in transmitting the false messages of rescue. Whatever the causes, the *Titanic* disaster was the clear impetus for the Radio Act of 1912, passed only three months later.[42] The Act relegated amateurs to limited space in the short wave spectrum and set the precedent for government regulation of the airwaves in the future.

As World War I consumed the nation's focus, the government took control of both the airwaves and the railroads. It standardized the equipment across different rail lines and enforced strict requirements on the use of radio. When the country emerged on the other side of the war, Congress was faced with a question: turn control back over to railroads and communications companies, nationalize the industry, or do some combination of these.[43] For companies that had been governed by the Interstate Commerce Commission, it was decided that they should be allowed to re-take control of their assets on the condition that they further unify their different lines. Mergers were encouraged based on the idea that that there was a clear national benefit to a unified, interoperable system. The Transportation Act of 1920 provided the guidelines. It also explained that mergers must be proposed to the Commission, which would hold a public hearing. "If after such hearing the Commission finds that the public interest will be

[42] Douglas 216-239.

[43] "Partial Merger of Roads Favored: Interstate Commerce Commission Opposes Return to Anti-Pooling Conditions," *The New York Times*, 6 Dec.1918, 14.

promoted by the consolidation and that the conditions of this section have been or will be fulfilled, it may enter an order approving and authorizing such consolidation."[44]

Things were not as well prescribed in the area of radio regulation. Commerce Secretary Herbert Hoover was leading ad-hoc rulemakings without clear direction from Congress. Hoover had proposed that Congress go beyond the limited scope of the 1912 Act and transfer full control over radio policy to the Department of Commerce, which shared decision-making power with the Post Office and the Navy. He did not succeed in this effort, but through a series of annual radio conferences he started in 1922, the department slowly developed as the de-facto rule-maker. Hoover decided upon the terms of using radio frequencies and chose which entities received licenses. At the 1925 conference, he stated, "the choice is between public interest and private desire, and we need not hesitate in making a decision. . . . The use of a radio channel is justified only if there is public benefit."[45] Private companies were viewed as public trustees of the spectrum, and the radio frequencies were given only in service of the public. Nevertheless, the businesses at the table were rapidly turning radio from many-to-many conversations to one-to-many broadcasts. As Paul Starr explains, "Radio fit [Hoover's] agenda perfectly in the early twenties, when he saw his role at Commerce as fostering economic growth, including the promotion of new industries."[46]

Although Hoover used the language of public interest, he framed it in terms of serving "the great body of the listening public," and noted, "there is no proper line of

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[44] The Transportation Act of 1920, approved 28 Feb. 1920 <http://laws.lp.findlaw.com/getcase/us/258/204.html>.

[45] Fourth Radio Conference, 1925, qtd. in Streeter 57.

[46] Starr 333.

conflict between the broadcaster and listener."[47] William D. Rowland, Jr., explains that these twin assumptions emphasized ratings-based market analysis and implicitly assumed that business profitability equaled public benefit.[48] Jessie Walker notes, "Established broadcasters, looking to reduce competition, wanted the government to limit the number of licenses it would issue. They had a friend in Hoover."[49] The 1925 conference decided to stop granting any new licenses whatsoever, claiming congestion of the airwaves. However, Zenith contended that the conference had no such jurisdiction. When a court sided with Zenith and the Justice Department agreed, all regulations to date were invalidated and the spectrum was flooded with interfering broadcasts.[50] Starr explains:

> The resulting cacophony produced the impetus for change that Hoover had been unable to provide on his own. This was the second generative crisis of radio regulation. As the sinking of the Titanic had precipitated the Radio Act of 1912, so the anarchic deregulation of 1926 finally jolted Congress into action.[51]

Congress faced a dilemma when trying to translate the license-granting conditions into formal process. What really was the standard for choosing one applicant over another? How could the law define the seemingly subjective criteria? Hoover's "public

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[47] Fourth Radio Conference, 1925, qtd. in Newton N. Minow and Craig LaMay, *Abandoned in the Wasteland: Children, Television, and the First Amendment* (New York: Hill and Wang 1995) 73.

[48] Rowland, *II* 371.

[49] Jessie Walker, *Rebels on the Air: An Alternative History of Radio in America* (New York: New York UP, 2001) 32.

[50] Starr 341-342.

[51] Starr 343.

interest and private desire" language was somewhat attractive. Senator Clarence C. Dill gave the following account much later:

> A young man on the committee staff had worked at the Interstate Commerce Commission for several years. . . and he said, "Well, how about 'public interest, convenience and necessity'? That's what we used there." That sounded pretty good, so we decided we would use it, too.[52]

In short, the "public interest" language from the Interstate Commerce Commission was "close enough" and it solved a practical wording problem. It did not, however, specify exactly what it all meant. Instead, the Radio Act of 1927 created the Federal Radio Commission, an expert agency designed to consider the details. This set up the structure, and the tension, of broadcast regulation for decades to come. Unlike common carriers, license holders could exclude all others from using their channel.[53] Rowland claims that this reinforced the notion that "the public interest lay in the combination of technical capacity (solve the interference problem) and economic strength."[54] Media theorist Ithiel de Sola Pool sees this as the moment when government went astray from the fundamentals of communications regulation.

> It was not until the 1920's however, that communications policy in the United States most seriously lost its way. Without adequate thought, a structure was introduced for radio which had neither the libertarian features of the common carrier system nor those of the free market. The assumption of the new

[52] Minow and LaMay 4.
[53] Rowland, *II*, notes that in the 1925 Conference's final recommendations, Hoover and the industry representatives pushed for the benefits of monopoly control without the obligations that traditionally came along with public utilities: "That those engaged in radio broadcasting shall not be required to devote their property to public use and their properties are therefore not public utilities in fact or in law; provided, however, that a license or a permit to engage in radio communication shall be issued only to those who in the opinion of the Secretary of Commerce will render a benefit to the public" (p. 372).
[54] Rowland, *II* 377.

system was that spectrum was extremely limited and had to be allotted to chosen users.[55]

Of course, it was not solely the regulators that pushed radio toward a one-way format dominated by highly produced programming. The nature of the broadcast technology and the facilities costs propelled license holders toward that model. In 1922, AT&T had obtained the license to operate WEAF in New York City. They saw radio as an extension of their telephone business, and adopted a common-carrier like approach in which anyone could air their message to the public for a fee. Starr notes that, "the common-carrier conception, however, not only overestimated the demand at that time for such a service; it also ignored the interest of a broadcaster in building up its audience by airing programs of dependable quality."[56] Within a few years, the antitrust authorities began to develop concern about AT&T extending its market power to this new medium, and the company negotiated a deal to sell the station in 1926.

Meanwhile, many claimed that the Interstate Commerce Commission was failing to keep up with its duties with respect to telephone and telegraph. As the FRC gained jurisdiction over all wireless communication, it made less sense that the ICC work in parallel. In the Communications Act of 1934, the FRC became the Federal Communications Commission (FCC), and gained control over the communications industries formerly overseen by the ICC. Telephone and telegraph were classified under the Communications Act's "Title II – Common Carriers" whereas the language of the 1927 Act fell under "Title III – Radio." The "public interest" language of English common law had been woven into American case law, cross-pollinated from the

[55] Ithiel de Sola Pool, *Technologies of Freedom* (Cambridge, MA: Belknap-Harvard UP, 1983) 232.

[56] Starr 337.

common-carriage statutory structure into broadcast, and reunited in the Communications Act of 1934.

B. TOWARD ABUNDANCE

As the Communications Act went into effect, communications technology was already starting to outpace it. Advances in telephony stretched the detailed regulations that governed it. New forms of radio modulation offered better listening experiences, and ultimately visual radio – television. Later, coaxial cable emerged as a way to transmit radio via the same spectrum but through controlled, non-interfering wires. All of this added a measure of abundance to the relatively limited capacity of the first generation of channels. By the end of the twentieth century, this shift was used as a justification to undo many of the regulations traditionally explained in terms of the public interest.

1. Carriers, Trustees, and Franchises

The peculiar structure of the Communications Act generated distinct "silos" of regulations, based on the technology at hand. Telephone and telegraph, as well as other "telecommunication" services, stayed under the purview of Title II. Here, the traditional common carrier arguments were the strongest, and the FCC promulgated detailed rules about rates and practices. For a long time, it was simply assumed that these services were a "natural monopoly" in which competition would fail. How many competitors could be expected, after all, to build out the facilities and put copper wires in the ground to every home? The government maintained that it was far more efficient to simply maintain non-discriminatory rules such that AT&T could not pick and choose whom customers could call. They were also subject to wide-ranging rate regulation. This ultimately facilitated a

certain degree of competition, at least in the long-distance market. In the 1970's, companies like MCI developed nationwide backbones, which AT&T customers could use by first calling a special access number. In the local and last-mile access market, however, competition has only recently come in the form of cellular and cable telephony.

The non-discriminatory obligations of common-carriers sparked other innovations as well. The landmark 1968 *Carterphone* decision by the FCC allowed customers to attach any device to the phone network, as long as it did not harm the network. The familiar black rotary phone gave way to a variety of devices. Machines began to use the phone system to communicate with each other. Fax machines and modems were clearly a harbinger of things to come. Common carriers saw a business opportunity in this development and sought to charge more for access to dial-up services such as Lexis-Nexis or stock brokerages. Others wondered if the FCC would step in and regulate the practices of those dial-up services themselves. In a series of decisions, referred to as the *Computer Inquiries*, the FCC distinguished between "basic" and "enhanced" services. Basic services were the traditional common carrier transport services. Those would continue to be regulated under non-discriminatory rules, which would bar the phone company from charging more for calling particular numbers. Enhanced services included the various dial-up services, and the FCC explicitly chose to forbear from any regulation of the services themselves. Indeed, it is unclear that they would have had the jurisdiction to regulate something that was not transport.

In Title III – Radio, the dominant rationale continued to be public trusteeship. The airwaves were a common public good, but the reality of interference meant that the government needed to coordinate its use. In 1927 the Commission had begun to grant

licenses based on a determination of the "public interest," and it would go on to explain in 1928 that this was "a matter of comparative and not an absolute standard."[57] A year later it further explained that programming should meet the "tastes, needs, and desires of all substantial groups among the listening public,"[58] among other things. The Commission continued to use this reasoning to deny licenses to "propaganda" stations, scam-artists, and hateful speakers.[59]

The question of what constituted "the public interest" dominated rulemakings for decades to come. The FCC issued the so-called "Blue Book" in 1946, which tried to explain the proper balance of types of programming, and released a "Policy Statement" in 1960 that sought to formalize these criteria.

The trusteeship rationale of broadcast regulation is perhaps best exemplified in FCC Chairman Newton Minow's 1961 speech to the National Association of Broadcasters, in which he said, "Gentlemen, your trust accounting with your beneficiaries is long overdue. Never have so few owed so much to so many."[60] Minow was frustrated with what he saw as a "vast wasteland" when he tuned across the dial. Undoubtedly there was some amount of trivial content in prime time, and some edifying content that was never aired. However, the task of determining which was which was proving to be very difficult, and enforcement was close to impossible. Krotozynski claims that "the

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[57] Statement by Federal Radio Commission Relative to the Public Interest, Convenience or Necessity, 2 FRC Ann. Rep. 166 (1928), qtd. in Krasnow, n. 20.

[58] Great Lakes Broadcasting Co., 3 FRC Ann. Rep. 32 (1929*),* affirmed in part and reversed in part, 37 F.2d 993 D.C. Cir., cert. dismissed, 281 U.S. 706 (1930).

[59] For an insightful account of this period, see Hal Abelson, Ken Ledeen, and Harry Lewis, *Blown to Bits: Your Life, Liberty, and Happiness after the Digital Explosion* (Upper Saddle River, NJ: Addison-Wesley, 2008) 260-273.

[60] Newton N. Minow, "Television and the Public Interest," speech to the National Association of Broadcasters (9 May 1961).

public trustee model of commercial broadcasting is doomed to failure because it is largely antithetical to the commercial interests of broadcasters and virtually incapable of being vigorously enforced."[61] The fundamental model of broadcast was for broadcasters to choose what consumers could see, and it was not clear that the government was going to do a better job. Nevertheless, in 1969, the Supreme Court would uphold the FCC's authority to determine content restrictions on licensees, citing the public interest.[62]

By the end of Chairman Minow's tenure, a new technology was emerging – cable television. In some ways, cable looked like a mixture of common carriage and broadcast. It took a common carrier-like technology (wires) and used it toward a broadcast end (one-way transmission). During the 1960's and 1970's, the Commission struggled with where cable television fit its mandate. Regulations were ad-hoc and often focused on cable's role as a repeater of weak broadcast signals.[63] Indeed, Patrick R. Parsons explores the struggle to define cable in the late 1950's and stated that its regulatory status as either common carrier or broadcast was the battleground between industries.[64] As he describes it, the key fight was to attempt to create a "taken-for-granted" vision of a specific media system. By the time the Supreme Court debated the constitutional status of cable television in 1986 (*City of Los Angeles v. Preferred*, 476 US. 488), it first sought to better understand the nature of the medium. Parsons explains that framewoks for understanding media are constructed via social practice. In the case of cable, the powers at work

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[61] Krotoszynski 2122.

[62] *Red Lion Broadcasting Co. v. Federal Communications Commission*, 395 U.S. 367, 1969.

[63] FCC Cable TV Fact Sheet, June 2000 <http://www.fcc.gov/mb/facts/csgen.html>; Ozro William Childs, IV, "The FCC's Proposed CATV Regulations," *Stanford Law Review* 21.6 (June 1969): 1685-1713.

[64] Patrick R. Parsons, "Defining Cable Television: Structuration and Public Policy," *Journal of Communication* 39.2 (1989): 10-26.

successfully defined cable as analogous to broadcast in its social role, thus enabling regulatory flexibility when its rules for use became codified in policy.

Cable companies required rights-of-way in places where they sought to put wires into the ground, and localities used this fact to extract certain concessions. Through individually negotiated franchise agreements, many cities gained a percentage of annual cable revenue as well as access to a limited number of channels for "public" use. In 1972, advocate Theadora Sklover explained the public access ethos: "We're not here to editorialize or make decisions about what people can say over the air."[65] The FCC asserted its authority to require cable operators to provide channels to "public, educational, and government" channels (PEG) through a series of rulemakings. Public access would remain the closest thing that television had to common carriage, but its quality and relevance would be questioned for decades.

In 1984, Congress clarified the FCC's mandate in cable television with the passage of the Cable Act. The Act added a "Title VI" in the Communications Act (Titles IV and V contained administrative details), thus establishing yet another technology-specific regulatory silo. Where cable interacted with broadcast, the Commission exercised its jurisdiction to require cable systems to carry local programming (the so-called "must carry" rules). Much of Title VI dealt with franchising and addressed the places where federal, state, and local jurisdictions intersected. Title VI as originally drafted did not contain reference to the "public interest" per se, but one of the stated goals was to "assure that cable communications provide and are encouraged to provide the

[65] Theadora Sklover, qtd. in Ralph Engelman, "Origins of Public Access Cable Television 1966-1972," *Journalism Monographs* 23 (Oct. 1990).

widest possible diversity of information sources and services to the public."[66] For better or worse, this did not carry the content-level regulatory force that Title III imposed on broadcast. After all, cable carriers were not as clearly public trustees. Furthermore, cable had been socially defined as distinct from common carriage, unlike the telephone companies in Title II. Franchising was the most obvious toe-hold for regulators, but it was also a highly decentralized structure.

2. More Channels and Bluer Skies

The 1984 Cable Act codified the medium as regulated separately from broadcast and common carriers, but the lead-up to its passage affected the framing of communications regulation as a whole. As a technology, coaxial cable had been in use since the 1950s for receiving and retransmitting distant signals within small communities. In the late 1960's, the dominant term shifted from "Community Access TV" (CATV) to simply "cable." Thomas Streeter has documented how a new discourse developed around this time, rich with rhetoric about how the globally connected multi-channel universe of cable would enlighten society as a whole.[67] Throughout this so-called "Blue Sky" era (which lasted into the early 1970's), commentators advocated a utopian view of the technology that resisted traditional governmental regulation. Cable corporations, special interests, and free speech advocates with diverse motivations and expectations all looked to cable as the solution to our communication ills. As Streeter notes, the president took notice: "Cable offered what seemed to be a major outlet for [Lyndon] Johnson's progressive hopes. Cable could increase citizen participation, allow repressed minorities

[66] Cable Act, Sec. 601.
[67] Thomas Streeter, "The Cable Fable Revisited: Discourse, Policy, and the Making of Cable Television," *Critical Studies in Mass Communication*, 4 (1987): 174-200..

cultural and political expression, and generally help lead society toward a more enlightened future."[68]

Indeed, Johnson saw the current series of technological developments as an opportunity to further the public interest. When the Carnegie Corporation offered to fund a commission to investigate the future of public television, Johnson appointed the members of the committee, saying, "From our beginnings as a nation we have recognized that our security depends upon the enlightenment of our people; that our freedom depends on the communication of many ideas through many channels."[69]

In short, the country needed better content that was available through more channels. The Carnegie Commission ultimately recommended the creation of the Corporation for Public Broadcasting (CPB), which Johnson signed into law in 1967. At its core, CPB was to be concerned with fostering better programming and ensuring distribution via a nationally interconnected system.[70] The language of an ever-expanding menu of channels and programming fit cable's "Blue Sky" narrative. The model was one-way transmission from producer to consumer. Nevertheless, there were also hints that the new technologies could be something more. Streeter documents many breathless references to "next generation high capacity, two-way cable systems, to satellites, to systems that combined voice, computer, and television signals all on the same wire, to the

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[68] Streeter, "The Cable Fable" 190.

[69] Carnegie Commission on Educational Television, *Public Television, a Program for Action: The Report and Recommendations of the Carnegie Commission on Educational Television* (New York: Bantam, 1967) vii.

[70] E. B. White exemplified the focus on programming quality in his letter to the Carnegie Commission, excerpted at the beginning of the report, saying, "Noncommercial television should address itself to the ideal of excellence, not the idea of acceptability – which is what keeps commercial television from climbing the staircase. I think television should be the visual counterpart of the literary essay, should arouse our dreams, satisfy our hunger for beauty, take us on journeys, enable us to participate in events, present great drama and music, explore the sea and the sky and the woods and the hills" (p. 13).

generally 'glittering' promise of this dazzling new technology."[71] Johnson was clearly swept up in this language, and at the signing of the Public Broadcasting Act, he looked beyond the broadcast nature of the institution he was creating:

> What hath man wrought? And how will man use his miracles? The answer just begins with public broadcasting. . . . I believe the time has come to stake another claim in the name of all the people, stake a claim based upon the combined resources of communications. I believe the time has come to enlist the computer and the satellite, as well as television and radio, and to enlist them in the cause of education. . . . So I think we must consider new ways to build a great network for knowledge—not just a broadcast system, but one that employs every means of sending and storing information that the individual can use. . . . Yes, the student in a small college tapping the resources of the greatest university in the hemisphere. The country doctor getting help from a distant laboratory or a teaching hospital; a scholar in Atlanta might draw instantly on a library in New York; a famous teacher could reach with ideas and inspirations into some far-off classroom, so that no child need be neglected.[72]

This seemingly "wild and visionary idea" sounds remarkably close to the internet as it manifest itself some thirty years later. It is possible that Johnson was swept up in the "Blue Sky" rhetoric and made a remarkably prescient prediction. However, there is another explanation as well. It is an explanation that recognizes that overblown promises ultimately served monopolistic corporate interests, but also appreciates the nascent

[71] Streeter, "The Cable Fable" 178.

[72] Lyndon Johnson's comments upon signing the Public Broadcast Act of 1967 <http://www.cpb.org/aboutpb/act/remarks.html>.

development of network technologies that would ultimately allow a measure of realization of these promises. Attached to the end of the Carnegie Commission's report was a series of supplementary papers. One of these papers was written by MIT professor J. C. R. Licklider, who was at the time deeply involved in developing early internet technologies. The Commission's report explained that "Dr. Licklider's paper was completed after the Commission had formulated its own conclusions."[73] It is perhaps not surprising that the paper departs entirely from the focus of the Commissions report and recommendations. Not only does it challenge the fundamental "better content, more channels" thrust of the report, it defines itself in opposition to "broadcast" mentality:

> [A] person who thinks of educational television as a set of educational functions supported by the framework of conventional broadcast television is unlikely to think of television as a medium for two-way communication or as a way of transmitting the text of a book or the stimulus material for a course of programmed instruction. The main purpose of this paper is to explore some of the possibilities that come to mind when one deliberately looks aside from the central line of thought about educational television and rejects the assumption that educational applications have to be built upon the framework of conventional broadcast television. (The term "broadcast," as I use it here, is not intended to imply that signals are necessarily radiated into space from an antenna. If a program were sent out to the public through coaxial cables, the program would be "broadcast."[74]

[73] Carnegie Commission 113.

[74] J. C. R. Licklider, "Televistas: Looking ahead through Side Windows," in Carnegie Commission, 201-225.

Licklider goes on to explain how interactive participation through television holds far more educational promise than the dominant one-way model. He explains that it would require a two-way "network" model and more sophisticated "receivers" that might be controlled by "pointing to a part of the picture with a stylus or by pressing buttons on a portable response unit."[75] He discusses newspapers with customized news feeds, interactive book retrieval, and distance learning. He predicts that cable wires will "evolve into multipurpose local networks, and that local networks will be linked together to form regional, national, and even international networks."[76] The greatest public interest would therefore lie in adapting the transmission-only technologies for two-way communication.

Whether or not the president had personally read Licklider's paper, his remarks certainly echo these ideas. Earlier that year, Johnson had commissioned a task force on communications policy, with an emphasis on satellites.[77] Nevertheless, the cable industry would not develop anything resembling such functionality until the turn of the twenty-first century. Indeed, they would only do so after dial-up internet had already begun to deliver similar functionality. To be sure, early cable and satellite technology had trouble supporting the grand visions of two-way conversation. In addition, the broadcast model was culturally ingrained and financially lucrative. As it turned out, the language of many channels and consumer choice would dominate "public interest" communications policy for decades to come.

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[75] Licklider 208.

[76] Licklider 213.

[77] Eugene V. Rostow, *President's Task Force on Communications Policy: Final Report* (Washington: GPO, 1968).

3. The Public's Interest and the Marketplace

Through the 1970's, communications policy became increasingly focused on enabling competition and trusting market forces. This grew out of the notion that on the broadcast side of things cable was chipping away at scarcity, and that on the common carrier side of things new entrants were challenging the AT&T monopoly. This was particularly true in the long-distance telephone market, where MCI and others had begun to compete. In 1979, the FCC stated,

> Primarily as a result of technological and regulatory developments, the telecommunications industry has evolved from one dominated by a few large entities where service was provided largely on a monopoly basis to one where a degree of competition now exists for the provision of some communications services. . . . Among our goals in this proceeding are to investigate and to deregulate so far as possible consistent with the public interest in the emerging competitive telecommunications market.[78]

The Commission went out of its way to trace the regulatory roots of the public interest standard and explain why this deference to competition complied with the agency's mandate to ensure non-discriminatory access:

> Although both the Interstate Commerce Act and the Communications Act require rates that are not unjustly or unreasonably discriminatory, neither Act purports to dictate how the reasonableness or justness of discriminations are to be determined. Rather, the question of whether a preference, advantage or discrimination is unreasonable or unjust has been left by Congress to the

[78] 77 F.C.C.2d 308.

judgment and discretion of the Commission. *Board of Trade v. United States*, 314 U.S. 534 (1942). In light of the similar language of the Interstate Commerce Act and the Communications Act, our knowledge that the relevant provisions of the Communications Act were adopted from the ICC Act, and the absence of any contrary legislative history, we are convinced that this agency, like the I.C.C., charged by law with assuring just and reasonable non-discriminatory rates, has the same statutory authority to exercise judgment and discretion as does the I.C.C.[79]

Congress in passing the Communications Act of 1934 could not, of course, anticipate the variety and nature of methods of communications by wire or radio that would come into existence in the decades to come. In such a situation, the expert agency entrusted with administration of a dynamic industry is entitled to latitude in coping with developments in that industry. . . . In a statutory scheme in which Congress has given an agency various tools with which to protect the public interest, the agency is entitled to some leeway in choosing which jurisdictional base and which regulatory tools will be the most effective in advancing the Congressional objective.[80]

When it came to "broadcast" television (both in the traditional wireless sense and via coaxial cable), there was some additional competition as well. By this time, satellite-fed cable had multiplied the number of channels available to consumers. Many began to

[79] 77 F.C.C.2d 308, 39.

[80] 77 F.C.C.2d 308, 100.

argue that scarcity, which had justified content regulation in the first place, had given way to abundance. The broadcast industry went so far as to claim that public ownership of the airwaves had no real legal precedent.[81] The language of abundance found an especially receptive ear with 1981-appointed FCC Chairman Mark Fowler. The Chairman described why new technologies had made traditional broadcast regulatory models obsolete:

> Fifty-four years ago, Congress passed the Radio Act of 1927. That statute and its successor in 1934 created the federal Communications Commission and brought something unique into the American experience: government licensing of a medium of creative expression. . . . But just as the technologies we regulate have changed, so too must change the traditional relationship between the Federal Communications Commission and broadcasters. Put simply, I believe that we are at the end of regulating broadcasting under the trusteeship model. Whether you call it "paternalism" or "nannyism," it is "Big Brother," and it must cease. I believe in a marketplace approach to broadcast regulation. . . the number of outlets in broadcasting does not justify the trusteeship model, or its consequences. Scarcity, to my mind, is a condition affecting all industries. Land, capital labor, and oil, are all scarce...[82]

[81] "Under past or present legal authority the notion that the public or the government 'owns' the airways is without precedent": Mark S. Fowler, the National Association of Broadcasters 1979, qtd. in Rowland, I, fn 6.

[82] Mark S. Fowler, "The Public's Interest," *Communications & Law* 4 (1982), 51-55 (transcript of address, International Radio and Television Society, Waldorf Astoria, New York, 23 September 1981).

From Fowler's perspective, the government's unprecedented role in policing content was a dangerous free speech violation that in any event was inferior to the wisdom of the market. Furthermore, there was nothing special about television that meant it should have heightened scrutiny. He claimed, "Television is just another appliance. It's a toaster with pictures. Let the people decide through the marketplace mechanisms what they wish to see and hear."[83] Given the relative abundance of television channels, consumers could exercise choice and thus exert pressure for the types of content they wished. Fowler explained in his famous 1982 co-authored article that "the public's interest, then, defines the public interest."[84] Of course, this argument was not new. The notion that the most commercially viable stations would best serve the demands of the mass public is rooted in Hoover's 1920's rhetoric. It is what led Rowland to conclude that the trusteeship model contained the "seeds of its own compromise, if not destruction."[85]

1984 proved to be a big year for communication policy. The Supreme Court determined that the Fairness Doctrine, which imposed content requirements on broadcasters, was indeed chilling speech. The FCC would systematically dismantle the elements of the doctrine and move further toward Fowler's "marketplace approach." When it came to common carriers, the market-based antitrust analysis made its biggest intervention to date. The Justice Department had settled an antitrust suit with AT&T, and in 1984 the company was broken up into the "regional bells." The logic was based on the notion that the divested company would allow for sufficient competition in the long-

[83] Mark Fowler, interview, *Reason* 1 November, 1981.

[84] Mark S. Fowler and David S. Brenner, "A Marketplace Approach to Broadcast Regulation," *Texas Law Review* 60 (1982): 210.

[85] Rowland I, at 309.

distance market, thus ensuring a degree of efficiency and consumer protection. Finally, the Cable Act of 1984 established cable as its own regulatory silo, free of most of the traditional public interest obligations.

New uses of wireless began to stretch the definitional capabilities of the technology-based Communications Act. As cellular phones became widespread, amendments recognized that they were functionally common carriers but required radio spectrum to operate. When the FCC granted the first wave of cellular licenses, it conducted comparative hearings (commonly known as "beauty contests") to decide which companies should obtain them. It imposed most of the standard common carrier obligations on their operation. As a result of court challenges and outrage from competitors, the Commission shifted to a "lottery" based system in the 1980's in which licenses were granted at random. This resulted in hundreds of applications from shell companies hoping to "strike it rich" with one of the valuable licenses that they could then effectively "sell" on the secondary market. This structure resulted in more court cases and dissatisfaction all-around (except for the lucky few), and in 1993 Congress authorized the use of auctions in order to allocate spectrum.[86]

1993 was a milestone year for advocates of the Fowler-style "marketplace approach" to radio regulation. Notably, Fowler had originally spoken specifically about broadcast licenses, but Chicago-school economics were now spreading much more broadly into FCC policy. Many traced this thinking back to economist Ronald H. Coase's 1959 article "The Federal Communications Commission," in which he famously advocated that the spectrum should be treated as pure property and allocated to the

[86] My telling is largely based on the account found in Jonathan E. Nuechterlein and Philip J. Weiser, *Digital Crossroads : American Telecommunications Policy in the Internet Age* (Cambridge, MA: MIT UP, 2005) 235-239.

highest bidder.[87] Coase argued that competition would ensure that the scarce resource would be used efficiently. When, in 1993, Congress instructed the Commission to implement auctions, it was endorsing the notion that competitive market forces inherently served economic efficiency and the public interest.

That same year, the Clinton administration proposed new efforts designed to foster the "National Information Infrastructure" (NII). The "NII" had come to refer to the sum of emerging network technologies. The Administration drafted legislation that would create a new Title VII for the Communications Act, specifically to give the FCC jurisdiction over the internet. It noted, "A new Title VII would provide a unified, symmetric treatment of providers of two-way broadband services, in contrast to the present disparate treatment of common carriers and cable operators under Titles II and VI of the Act."[88] However, the proposal was sufficiently stalled by industry advocates wary of new regulation that it did not pass.

Instead, in 1996, Congress undertook the most sweeping update to the Communications Act since 1934. The Telecommunications Act of 1996 embraced the general notion that removing regulation would lead to more competition and therefore serve the public interest. This was especially true when it came to traditional common carriers, and Congress sought to create conditions that would encourage more competitors for telephone service. This involved allowing the regional Bell companies back into the long-distance market and establishing a set of requirements requiring last-mile carriers to sell service to long-distance carriers who wanted to get into the market.

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[87] Ronald H. Coase, "The Federal Communications Commission," *Journal of Law and Economics* 2 (Oct. 1959): 1-40.

[88] Administration White Paper on Communications Act Reforms, 25 Jan. 1994. Available at: <http://www.ibiblio.org/pub/academic/political-science/internet-related/NII-white-paper>.

Congress went so far as to explicitly state that the Commission could "forbear" from enforcing any Title II it wished, so long as it judged that forbearance would serve competition. No further public interest consideration would be necessary beyond that.

> [T]he Commission shall consider whether forbearance from enforcing the provision or regulation will promote competitive market conditions, including the extent to which such forbearance will enhance competition among providers of telecommunications services. If the Commission determines that such forbearance will promote competition among providers of telecommunications services, that determination may be the basis for a Commission finding that forbearance is in the public interest.[89]

In short, the public interest had become synonymous with competition.

Another section of the Telecommunications Act of 1996, also referred to as the Communications Decency Act (CDA), offered the first mention of the internet in a communications statute. The CDA sought to impose certain restrictions on transmission of "indecent" material over the internet. This was an odd but inexplicable *addition* of regulation within a bill that was otherwise highly deregulatory. There was considerable concern over the growing proliferation of pornography, and some thought that the legacy of content regulation from broadcast should be extended to the internet. In other areas, however, the CDA included language that emphasized a hands-off approach instead:

> SEC. 230. PROTECTION FOR PRIVATE BLOCKING AND SCREENING OF OFFENSIVE MATERIAL.
>
> (a) FINDINGS--The Congress finds the following:
>
> [. . .]

[89] Telecommunications Act of 1996, Title IV, Section 401, codified as 47 USC 159 (10)(b).

> (4) The Internet and other interactive computer services have flourished, to the benefit of all Americans, with a minimum of government regulation.
>
> [. . .]
>
> (b) POLICY- It is the policy of the United States--
>
> (1) to promote the continued development of the Internet and other interactive computer services and other interactive media;
>
> (2) to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation.

Most of the CDA was ultimately struck down as unconstitutional in *Reno v. ACLU*,[90] although Section 230 remains in the Act. It is noteworthy that regulation of the internet in this context refers to regulation of internet *content*. Regulation of *transport* clearly fell under Title II (to the extent that the internet service in question was delivered via common carriers and to the extent that the Commission did not choose to use its new "forbearance" authority to withhold regulation).

Following the 1996 Act, the Bell companies re-entered the long distance market and several new "Competitive Local Exchange Carriers" (CLECS) tried to make a run at the local market. They did so by relying on the FCC's new "unbundling" rules, which required the local former Bells to sell access to its lines at a pre-determined rate. By 2002, many of the CLECs had gone bankrupt or lost regulatory battles to maintain the unbundled access that was their lifeblood.[91] The

[90] *Reno v. ACLU*, 521 U.S. 844 (1997).

[91] Larry F. Darby, Jeffrey A. Eisenach, and Joseph S. Kraemer, "The CLEC Experiment: Anatomy of a

market failed to produce competition precisely in those places where single firms retained control over facilities that were essential to competition. In the following years many more CLECs would go out of business or be acquired by the incumbents in a string of telecommunications consolidations.[92] It became clear that the Commission's experiment with local telecommunications competition was not working.

Nevertheless, this reality did not blunt the force of the competition rhetoric, and the Commission considered its role to deregulate and to defer to "the market" wherever possible. As a new FCC commissioner in 1998, Michael K. Powell stated,

> The night after I was sworn in, I waited for a visit from the angel of the public interest. I waited all night, but she did not come. And, in fact, five months into this job, I still have had no divine awakening and no one has issued me my public interest crystal ball. But I am here, an enlightened wiseman without a clue. The best that I can discern is that the public interest standard is a bit like modern art, people see in it what they want to see. That may be a fine quality for art, but it is a bit of a problem when that quality exists in a legal standard.[93]

Four years later, Powell had become somewhat more enlightened and articulated a distinctly market-oriented approach: "Indeed, if the Commission is to do its job, the public interest must reflect the realities of the marketplace and current spectrum use.

Meltdown," *Progress on Point* 23 September 2002 <http://www.pff.org/issues-pubs/pops/pop9.23clecexperiment.pdf>.

[92] The largest and most dramatic of these acquisitions was when Verizon acquired MCI in 2006.

[93] Michael K. Powell, "The Public Interest Standard: A New Regulator's Search for Enlightenment," American Bar Association 17th Annual Legal Forum on Communications Law, Las Vegas, Nevada, 5 April 1998.

Today, I would suggest that full and complete consumer choice of wireless devices and services is the very meaning of the public interest."[94]

The competition-only view of the public interest had permeated American policy discourse almost completely. This had happened in the same period during which broadband internet access was becoming a way of life for many Americans. Like cable and cellular phones, the broadband internet access posed a regulatory quandary. How should the Commission view broadband service that was delivered over non-common-carriers? If cable-based internet and DSL-based internet provided the same service, did it make sense to regulate them entirely differently?[95] The general deregulatory tone encouraged the Commission to find ways to lift the common carrier regulations on broadband altogether. Congress had given the Commission the "forbearance" option, but in 2002 the Commission chose a more radical path. It issued the Cable Broadband Order[96] which used the creative new strategy of defining cable internet as a "Title I" service. Title I is essentially the introduction to the Communications Act and contains no specific regulations at all. This decision meant that cable modems were free of regulation by default but subject to any specific new rules defined by the Commission. Several years of litigation ensued, and in 2005 the Supreme Court settled the matter in favor of the FCC's decision.[97] The FCC immediately declared that DSL was also an unregulated

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[94] Michael K. Powell, "Broadband Migration III: New Directions in Wireless Policy," Silicon Flatirons Telecommunications Program, University of Colorado, Boulder. 30 Oct. 2002 <http://www.fcc.gov/Speeches/Powell/2002/spmkp212.html>.

[95] Eli Noam was especially prescient on this matter, noting in 1994 that sustaining the common carrier status in an era of competitors that were not common carriers would undermine the doctrine altogether ("Beyond Liberalization II: The Impending Doom of Common Carriage," *Telecommunications Policy* 18 [1994]: 435-452).

[96] "Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, Declaratory Ruling and Notice of Proposed Rulemaking," 17 F.C.C.R. 4798 (2002).

[97] *National Cable & Telecommunications Association v. Brand X Internet Services*, 545 U.S. 967, 2005.

Title I service,[98] which was subsequently followed by similar declarations for wireless broadband[99] and even barely used technologies such as Broadband over Power Line.[100]

This set of decisions effectively classified all broadband as a vaguely regulated Title I service, despite the clear legacy of common-carrier regulated internet service in the dial-up era.[101] The decisions mark a significant step in the transformation of the public interest standard in communications law from being rooted in non-discriminatory safeguards to market-trusting responses.[102] To be sure, there was a great deal of counter-productive, inefficient, and special-interest language that had built up in the existing regulatory structure. Common carriage as it existed by the turn of the twenty-first century was a beast often divorced from reality. With the emergence of a new medium, the Commission chose to sidestep these concerns altogether. Still, when the Commission defined its way out of the Title II conundrum, it did not reflect a core change in the nature of public interest. It was a regulatory maneuver designed to avoid pitfalls in a broken regulatory system. The Commission then placed its hopes in the adjudication of "bad actors" that violated antitrust law or more general competition concerns. However, although antitrust might well be just as outdated, it is itself subject to broad interpretation,

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The court deferred to the FCC's judgment generally, and at that time the FCC had decided that cable broadband was a "Title I" service.

[98] "Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities," *Report and Order and Notice of Proposed Rulemaking*, 20 FCC Rcd. 14, 853 (2005).

[99] "Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks," Declaratory Ruling, 22 FCC, rcd. 5901 (2007).

[100] "FCC Classifies Broadband Over Power Line-Enabled Internet Access as 'Information Service,'" press release (3 Nov. 2006) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-268331A1.pdf>.

[101] James B. Speta, "FCC Authority to Regulate the Internet: Creating It and Limiting It," *Loyola University Chicago Law Journal* 35 (2004): 15-39 <http://ssrn.com/abstract=490122>. Speta also notes how this decision created a substantially muddied enforcement environment.

[102] Joseph D. Kearney and Thomas W. Merrill, "The Great Transformation of Regulated Industries Law," *Columbia Law Review* 98.6 (Oct. 1998): 1323-1409.

and some of its most relevant doctrine is in a confused state.[103] Will a competition-only approach remain faithful to the demands of the ever-elusive public interest standard?

C. THE INTERNET ETHOS

As communications policy was being reworked as competition policy during the second half of the twentieth century, engineers and scientists were imagining the next generation of computing technologies. They envisioned individuals who were empowered by easy-to-use storage and networking devices. These devices moved from theory to proof-of-concept and eventually to mass adoption, carrying with them the sensibilities of their designers. The ethos behind these personal computers and open networks differed greatly from the privately controlled media of the day. It began with the ability to store and retrieve local documents, then included connection of all documents in a vast library of knowledge, and ultimately encompassed a general purpose infrastructure that supported a broad range of whatever its users might envision.

1. Libraries of the Future

Theoretical computing devices were initially framed in terms of familiar metaphors, such as the library. Various thinkers asked how we might we organize, reference, and share all of this knowledge in such a way that we can make the best use of it as a society. Dr. Vannevar Bush was a prominent scientist during World War II, supervising thousands of other scientists working on the war effort. With the end of the

[103]Robert A. Skitol, "Three Years after *Verizon v. Trinko*: Broad Dissatisfaction with the Whole Thrust of Refusal to Deal Law," *The Antitrust Source 6.2 (*April 2007) http://www.abanet.org/antitrust/at-source/07/04/Apr07-Skitol4=27f.pdf.

war in 1945, he turned his attention to what he thought would be the next great societal need. His article, "As We May Think," strikes a collective chord as he lays out the core problem and a theoretical device:

> A record, if it is to be useful to science, must be continuously extended, it must be stored, and above all it must be consulted. Today we make the record conventionally by writing and photography, followed by printing; but we also record on film, on wax disks, and on magnetic wires. Even if utterly new recording procedures do not appear, these present ones are certainly in the process of modification and extension. [. . .]
>
> Consider a future device for individual use, which is a sort of mechanized private file and library. It needs a name, and, to coin one at random, "memex" will do. A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory.
>
> It consists of a desk, and while it can presumably be operated from a distance, it is primarily the piece of furniture at which he works. On the top are slanting translucent screens, on which material can be projected for convenient reading. There is a keyboard, and sets of buttons and levers. Otherwise it looks like an ordinary desk.[104]

Bush's "memex" was technologically impossible in its day, but it laid out both a technical approach and a normative motivation. Nearly twenty years later, researchers in

[104]Vannevar Bush, "As We May Think," *The Atlantic Monthly* July 1945: 101-108.

Cambridge, Massachusetts, would come to a similar set of conclusions. Under a grant from the Council on Library Resources, engineers and psychologists at the firm Bolt Beranek and Newman explored concepts and problems of libraries of the future. They chose to envision what might be possible by the year 2000. The researchers published their findings in a 1965 book, *Libraries of the Future*, and psychologist/engineer J. C. R. Licklider wrote in the introduction,

> Very great and pertinent advances doubtless *can* be made during the remainder of this century, both in information technology and in the ways man uses it. Whether very great and pertinent advances *will* be made, however, depends strongly on how societies and nations set their goals. Moreover, the "system" of man's development and use of knowledge is regenerative. If a strong effort is made to improve that system, then the early results will facilitate subsequent phases of the effort, and so on, progressively, in an exponential crescendo. On the other hand, if intellectual processes and their technological bases are neglected, then goals that could have been achieved will remain remote, and proponents of their achievement will find it difficult to disprove charges of irresponsibility and autism.[105]

This is the same Licklider that would, two years later, urge the Carnegie Commission to shift its focus from broadcast-based thinking to the interactive possibilities of new communications infrastructure. He would emphasize the two-way nature of learning, and the remarkable possibilities of networked technology.

[105] J. C. R. Licklider, Council on Library Resources, et al., *Libraries of the Future* (Cambridge, MA: MIT Press, 1965).

The critical difference between this early-sixties work and that of Vannevar Bush was that new storage and networking technologies could enable the kind of knowledge archiving, and especially sharing, that was pure fancy just twenty years before. *Libraries of the Future* lays out the state of experimentation at the moment in which the normative conviction to organize and share vast bodies of knowledge globally met the technological possibility to do so.[106] By the time the book was published, Licklider had already left Bolt Beranek and Newman in order to run a division of the Department of Defense's new Advanced Research Projects Agency (ARPA). In his role, he would decide which computing projects to fund nationwide. Hard drive technology was making storage faster and more practical, early graphical interfaces were making computing more user-friendly, and networking was making it possible to connect to distant computers.

In an era when most engineers could only envision computers as room-sized contraptions used for data processing, Licklider was remarkably prescient. Rather than focus on networking only as a means to "resource sharing" the processor, he saw the potential for computers to become valuable communication devices. In the opening of a co-authored 1968 paper, he remarked, "In a few years, men will be able to communicate more effectively through a machine than face to face."[107] Networking was key, and Licklider used his funding power at ARPA – and later his sway over his successors – to

[106] Indeed, in his paper for the Carnegie Commission, "Televistas," he would note, "The economic disadvantages of duplicating, distributing, and storing books that may never be read is obvious. Some of the techniques of what is currently known as the 'non-Gutenberg technology' make it possible to avoid most of that disadvantage" (p. 217).

[107] J. C. R. Licklider and Robert W. Taylor, "The Computer as Communication Device," *Science and Technology* 76 (April 1968): 21-31.

persuade engineers from across the country to cooperate on a standard, open system for interconnecting.[108] This would become the internet as we know it today.

When, in 1967, Licklider wrote that "local networks will be linked together to form regional, national, and even international networks," he was well aware that these advances were more than simply a larger library or higher quality educational television.[109] Indeed, the library of the future was not just a library. This type of "television" was nothing like the one-way transmission of the past. Instead, the internet would become a robust multipurpose network for knowledge, applications, and – most importantly – humans.

2. Avoiding Scarcity of Uses

The internet ethos was not originally articulated in the language of communications law. Instead, the early engineers described their goals in terms of ideas like robustness and flexibility. The internet evolved in an odd backwater, with government funding of little-known academic experiments. The community of researchers came from many different institutions where they were already pursuing a variety of projects. J.C.R. Licklider's vision when he funded these different groups was that they establish a common network platform to support the interoperation of the diverse systems and projects. Thus, at the core of the effort was the assumption that particular uses should not be prescribed. In retrospect, this transforms the dominant justification for broadcast law of the day – that scarcity requires government control of

[108] Mitchell. M. Waldrop, *The Dream Machine: J. C. R. Licklider and the Revolution That Made Computing Personal* (New York: Viking, 2001).

[109] Licklider, "Televistas" 213.

content. Instead, the internet mentality eschewed centralized control of transmissions by building decentralized user control into the protocols.

Jon Postel was a graduate student at UCLA when the first networking experiments were being conducted. He was part of the younger generation of computer scientists that met and exchanged ideas through ARPA funding for student conferences. Ideas turned into a digital network called the ARPANET, which eventually became the internet we know today. When defining "TCP," one of the fundamental internet protocols, Postel famously articulated what is now called the "robustness principle." The principle also describes the social ethos among the early internet community: "be conservative in what you do, be liberal in what you accept from others."[110] From a technical perspective, it means that routing entities on the network must pass along traffic from any source, as long as the structure of the message conforms to a minimally restrictive standard. This creates, from the bottom up, a store-and-forward system of packet-based communication. This system is open to all comers and allows innovation on top of the basic protocol.

This approach would be the foundation for the myriad uses of the internet to come. There were few technical or administrative hurdles to new innovators. There was no formal body that must approve a particular new way of using the network. All standards were set through "Requests For Comments" (RFCs), which were simply text files in which the authors explained their new approach. Well-defined RFCs with useful standards would be adopted, while impractical RFCs were not be widely implemented. Various internet engineers continued to meet informally to discuss the latest

[110] Jon Postel, "Transmission Control Protocol," Internet Request for Comments RFC 793, ISI (Sept. 1981).

developments, and in 1986 they formed the Internet Engineering Task Force (IETF) in order to evaluate RFCs. Even this semi-formalization of the standards-making process was remarkably open, and the IETF states that "any interested person can participate in the work, know what is being decided, and make his or her voice heard on the issue."[111]

As the internet began to enter the public eye in the 1990's, many described it as multiplying the effects of broadcast-like abundance. In 1997, *Wired Magazine* proclaimed the immanent blossoming of "push" technology, in which web browsers would die off in favor of broadcast-like transmissions from expert companies.[112] Long-time communications economist Bruce M. Owen wrote an entire book called *The Internet Challenge to Television* in which he explained why the internet was *not* like television, and predicted that "In its present form, it seems extremely unlikely that the Internet will ever reach most households, much less become a mass medium like television. . . . Meanwhile, television will continue to be delivered by means other than the Internet."[113] Implicit in both of these analyses is the notion that the internet is or should primarily be concerned with broadcast, or that its way of interacting with the legacy medium involves adding abundance of channels for relatively passive consumers. Indeed, Owen assumes that one can determine "appropriate" uses of the network and that things like IP Telephony are objectively inappropriate on economic grounds.[114] This flies in the face of fundamental assumptions of the internet developer community – assumptions that ultimately propelled the medium to precisely the success it enjoys today.

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[111] IETF, Internet RFC 3935.

[112] *Wired Magazine*, 5.03 (March 1997) <http://www.wired.com/wired/archive/5.03/ff_push.html>.

[113] Bruce M. Owen, *The Internet Challenge to Television* (Cambridge, MA: Harvard UP, 1999) 233.

[114] Owen 223.

The early engineers appreciated abundance, but an abundance of a different nature. Whereas the "Blue Sky" cable rhetoric and the advance of high speed telecommunications fostered hype of unlimited volume of transmission, internet engineers built into the network the capacity for unlimited types of interaction. These early engineers understood the scarcity of bandwidth all too well. They had worked with these limitations as they connected the very first links of the internet over specially leased AT&T phone lines. What would lead to long-term innovation was the decision to leave the power to invent or use new technologies on top of the network in the hands of the users.

Owen complained that "the whining of early Internet users, for whom everything was 'free' because someone else paid, has become tiresome."[115] The problem with this critique is that it misunderstands the type of freedom that many had come to value. To be sure, internet users were paying for their usage in various ways – dial-up fees, advertising attention, online purchases, etc. However, the real freedom came in the form of freedom from intermediaries who leveraged control over the types of usage. This is the same type of distinction that Free Software advocates describe when they say "free as in speech, not as in beer."[116]

However, this new kind of abundance of use can threaten the old order in which scarcity is used as a tool to protect legacy business models. Robin Mansell has explained how scarcity and abundance make up two opposite poles in a dialectic of market forces on the internet.[117] While early commentators declared the end of scarcity in the age of

[115] Owen 226.
[116] <http://www.gnu.org/philosophy/free-sw.html>.
[117] Robin Mansell, "New Media Competition and Access: The Scarcity-Abundance Dialectic," *New Media Society* 1.2 (1999): 155-182.

ubiquitous internet access, Mansell reminds us that intermediaries have a strong incentive to create artificial scarcity to protect their old ways of doing business. They may think that they know what users want, or they may decide that a particular set of uses will be more profitable and use their privileged positions to dictate outcomes. There is no inherent reason, she explains, that these new technologies will be able to overcome those tendencies. While technical infrastructure can predispose the internet to abundance of use, norms, laws, and especially markets can introduce self-interested scarcity.

Early internet activists realized that the law could be used toward the ends of limiting the "free as in speech" part of online abundance. As Congress debated new interventions into broadcast-like content regulation, John Perry Barlow delivered his now-famous "A Declaration of the Independence of Cyberspace," which opens this way: "Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather."[118] Barlow's vision is hands-off, assuming that government regulation can only do harm to the freedoms being enjoyed online. Around the same time, Jerry Berman and Daniel Weitzner explained how one-way channel scarcity threatens free speech whereas decentralized open-access networks more fully embrace the First Amendment.

> Some entity, generally the network owner and operator, must decide which of the large number of potential programs will be given access to the smaller number of channels available. This gatekeeper role is also required because the network architecture of both cable and broadcast media demands that all programming be collected at a central point for redistribution.

[118]John Perry Barlow <http://homes.eff.org/~barlow/Declaration-Final.html>.

The decentralized, open-access model presents a sharp contrast to the centralized, one-way channel model that typifies most mass media today. Properly implemented, the open-access model holds the promise of overcoming the diversity problems created by the centralized channel model. The open-access model would permit a level of diversity only possible today in the print medium. Moreover, this model's potential to lower publishing costs and increase connectivity promises a diversity of sources undreamed of in the era of print. The functional architecture of the open-access network model has two important features: (I) capacity for an unlimited number of information sources, and (2) decentralized access without the need for gatekeepers. An open-access network can accommodate a virtually unlimited number of information providers as well as information users. This is the case because the architecture of the network makes no distinction between users who are information providers and those who are information users. In fact, most users play both roles from time to time. All who obtain access have the option of making information available to all other users on the network; thus, the sources of information available are limited only by the number of users who seek access. Cable television or satellite networks, in contrast, are designed to add users relatively easily, but those users have no ability to send information to others on the network.[119]

[119] Jerry Berman and Daniel J. Weitzner, "Abundance and User Control: Renewing the Democratic Heart of the First Amendment in the Age of Interactive Media," *The Yale Law Journal* 104.7 (May 1995): 1619-1637.

There are two ways to read these early internet freedom-fighters. One interpretation is that the internet should be free of any government interventions whatsoever. [120] In the *Reno v. ACLU* case, which overturned the content regulations that Barlow so strongly opposed, the Court noted that

> [U]nlike the conditions that prevailed when Congress first authorized regulation of the broadcast spectrum, the Internet can hardly be considered a "scarce" expressive commodity. It provides relatively unlimited, low-cost capacity for communication of all kinds. . . . This dynamic, multifaceted category of communication includes not only traditional print and news services, but also audio, video, and still images, as well as interactive, real-time dialogue line can become a town crier with a voice that resonates farther than it could from any soapbox. Through the use of Web pages, mail exploders, and newsgroups, the same individual can become a pamphleteer. . . . [O]ur cases provide no basis for qualifying the level of First Amendment scrutiny that should be applied to this medium.[121]

The court was correct in noting that the internet enables a great deal more diversity than its mass-media predecessors. Nevertheless, it emerged in the context of a transport infrastructure has been regulated for a long time. Categorical regulatory forbearance of anything related to the internet is unwise in the context of market forces that motivate non-governmental intermediaries to generate artificial scarcity. If, based purely on the desire to refrain from speech-hampering regulation of the government, we

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[120] Steve Mitra, "The Death of Media Regulation in the Age of the Internet," *N.Y.U. Journal of Legislation and Public Policy* 4.2 (2001): 415-438.

[121] *Reno v. ACLU*.

are too timid to regulate speech-hampering conduct of carriers, we have worked against our own purposes. I do not think that this is what these thinkers meant to do. It is more appropriate to read the early internet advocates and the court as drawing a distinction between *content* regulation and *infrastructure* regulation. Indeed, governmental safeguards at the infrastructure layer can protect market-motivated discrimination at the content layer. Such an approach is compatible with the non-discriminatory principles in communication law, which have been manifest in technology-specific doctrines like common carriage and interconnection obligations.

This "layered" approach to internet regulation resonates strongly with the technical structure of the internet itself. At its core, the Internet Protocol (IP) defines a set of basic standards that are augmented by adding additional layers. IP is referred to as the "transport" layer, and other standards add functionality by building on top of this layer. Sending email, browsing the web, and streaming multimedia all involve specific implementations of content or application layer protocols. Individuals may choose how to use the core IP infrastructure available to them because these additional layers are all *modular*. This creates what has been called the "virtuous hourglass" of the internet, in which most of the technical intelligence resides in the hands of end-users and not at the core of the network.[122] When applied to regulatory structures, it entails a more function-based "horizontal" classification system compared to the technology based "vertical" silos of the Communications Act.[123]

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[122] Jonathan L. Zittrain, "The Generative Internet," *Harvard Law Review*, 119: 1974, (2006) <http://www.harvardlawreview.org/issues/119/may06/zittrain.pdf>.

[123] Richard Whitt and Stephen J. Schultze, " Emergence Economics," *Journal on Telecommunications and High Technology Law* 7.2 pending.

The promise of future robustness, technological innovation, and free speech online rests with this more nuanced understanding of the role of regulation. By translating time-tested non-discriminatory principles for infrastructure, regulators can square the ethos and technology of the internet with the legacy of communications law. Avoiding scarcity of uses means some limited intervention, but only at the transport layer. Scarcity of capacity will continue to be a challenge for the foreseeable future, but when citizens can choose how to use that limited capacity they will nevertheless enjoy an abundance that was impossible in the era of one-way media.

3. Encouraging Abundance of Peers

In many-to-many systems, there is a curious phenomenon that does not emerge in other environments. Each new user added to the network adds incremental value for all other users of the network. In the phone system, this meant that when more people subscribed to service, it became more valuable for those who might wish to call them (or be called). Likewise, fax machines became more useful as they became more widespread. On the internet, the more people, content, and applications that are accessible, the more useful it is overall. Economists call this a "network effect" and discuss the critical points at which particular networks experience rapid growth.[124] When proprietary standards generate network effects, the benefits accrue to whomever controls that proprietary standard. When open standards experience the same effects, all parties benefit. Whereas the "robustness principle" argues that the internet is for *every use*, network effects demonstrate that the internet is for *everyone*. This principle is so central

[124]Nicholas Economides, "Public Policy in Network Industries," NYU Law and Economics Research Paper no. 06-49 (Sept. 2006) <http://ssrn.com/abstract=936469>.

to the ethos and well-functioning of the network that early internet engineer Vint Cerf wrote an RFC entitled, "The Internet is For Everyone."[125] In the summer of 2008, several groups advocating for internet access, choice, openness, and innovation launched the "Internet for Everyone" campaign.[126]

However, not everyone has the same access to the internet. Most Americans have some form of access, but in many cases this is via a local library or a school. Even dial-up internet is a radically different experience from always-on broadband. The ability to send and receive at high speeds, from home, can determine whether one is fully able to participate in the network. Henry Jenkins calls this the "participation gap," and he emphasizes how this stunts digital learning, civic engagement, and cultural flourishing.[127] It also has serious effects on the overall economy and the ability for individual businesses to connect with customers. The network effects of the internet are potentially even more powerful than the network effects of one-to-one media like the telephone. Many people, acting according to many motivations—business, hobby, advocacy—multiply the value for everyone involved. This can often happen asynchronously. For example a web page or forum post that I create today may be used to someone else's benefit a year from now. On the internet, much of the value created is what economists call a "spillover" – an unintended positive benefit for others.[128]

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[125] Vint Cerf, "The Internet is for Everyone," Internet RFC 3271 <http://www.apps.ietf.org/rfc/rfc3271.txt>.

[126] <http://www.internetforeveryone.org/>.

[127] Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (New York: New York UP, 2006).

[128] Brett M. Frischmann, Mark A. Lemley, "Spillovers," John M. Olin Program in Law and Economics, Stanford Law School, Working Paper No. 321 (April 2006). Available at: <http://ssrn.com/abstract=898881>.

But why might we envision some kind of government intervention in the context of this principle of universal connectivity? To begin with, the internet is fast becoming a core utility, much like water, electricity, roads, or telephones.[129] This transforms it from a "nice to have" thing to a "must have." Historically, the government has had an active role in supporting these types resources, for the good of all citizens. More day-to-day tasks require the internet. This also places broadband more clearly in the class of other businesses traditionally considered to be infrastructure and traditionally subject to public interest obligations.

The network effects of the internet also argue for some form of government intervention. To begin with, the overall economic growth can be so strongly affected by these factors that intervention becomes a matter of international competitiveness.[130] Independent economic actors, especially the telecommunications carriers, are not necessarily motivated to connect everybody. They are motivated to connect those in the least expensive (typically the most dense) areas, or those from whom they can extract the most profits. This does not necessarily align with access for all. Thus, the national or global benefits of a universal network would not be realized without some incentives or requirements. The internet is a network of networks, and the potential network effects multiply as more users connect and invent new types of uses.

The related but distinct "essential facilities doctrine" comes from antitrust law. It dates back to the 1912 *United States v. Terminal Railroad Association* case in which the court decided that the owner of the only bridge across the Mississippi must grant

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[129] Kevin Werbach, "Connections: Beyond Universal Service in the Digital Age," *Journal on Telecommunications and High Technology Law* (2008), pending.

[130] Susan P. Crawford, "The Internet and the Project of Communications Law," 11 Feb. 2007 <http://ssrn.com/abstract=962594>.

nondiscriminatory access to all competitors. The reasoning was that shared usage of the bridge was the only way to preserve competition. The doctrine would be developed further in other contexts but would always deal with competitive effects between businesses. In 2004, the Supreme Court heard *Verizon v. Trinko*, which asked whether or not telecommunications carriers could be liable under the Sherman Antitrust Act for not adequately opening its network.[131] The Supreme Court delivered a substantial, if not completely damning, critique of the essential facilities doctrine as a whole. It also explained that communication technologies might be outside the scope of antitrust law if the FCC was already regulating the industry. Altogether, there is a great deal of speculation about how antitrust and essential facilities might affect communications law going forward.[132] Perhaps elements could be salvaged in the service of traditional public interest principles. Spencer Waller and Brett Frischmann explicitly seek to imbue the antitrust-based essential facilities doctrine with the traditional public interest considerations of public infrastructure.[133] I question whether this is approach is likely to succeed, although I applaud the authors' intent. On my reading, the doctrine was never central to public interest communications regulation, and it may not bear the weight of such obligations. The internet has become "essential" in the sense that it is a core part of citizenship, commerce, and culture – but arguing that the internet is for everybody need not rely on a narrowly conceived and legally battered doctrine.[134]

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[131] *Verizon v. Trinko*, 540 U.S. 398, 2004.

[132] Philip J. Weiser, "The Relationship of Antitrust and Regulation in a Deregulatory Era," University of Colorado Law Legal Studies Research Paper no. 06-19, *Antitrust Bulletin* 50 (2005): 549.

[133]Spencer Weber Waller and Brett M. Frischmann, "Revitalizing Essential Facilities," *Antitrust Law Journal* 75.1 (2008) <http://ssrn.com/abstract=961609>.

[134] Barbara Cherry attempts to document the various contexts in which services have been considered "essential" in some sense of the word, and lays out a framework for assessing which particular doctrines

The internet transforms the traditional dialectic of scarcity versus. abundance. By resisting scarcity of *uses*, it places choice in the hands of consumers. This avoids some of the First Amendment pitfalls of broadcast media and catalyzes innovation unlike the early telephone era. By encouraging an abundance of *users*, it welcomes everyone on an even footing. This extends the benefits of the network and amplifies the remarkable network effects. These norms are congruent with a long history of non-discriminatory access and universal service, but they transform some of the outmoded policies of recent history. The principles alone do not solve difficult questions such as "Who pays for it?" They do, however, shape the tools and means that policymakers might employ when trying to answer those difficult questions.

II. CONTEMPORARY REGULATORY DEBATES

Fundamental public interest principles are at the heart of a series of current federal regulatory debates. "The public interest" appears frequently in contemporary communications law and FCC rulemakings, but the force of the phrase has been diluted. In this section, I provide a brief survey of three leading battlegrounds and place them in the context of longstanding public interest principles.

A. NETWORK DISCRIMINATION

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apply in each context ("Utilizing 'Essentiality of Access' Analyses to Mitigate Risky, Costly and Untimely Government Interventions in Converging Telecommunications Technologies and Markets," *CommLaw Conspectus* 11.2 [2003]: 251-275). I am sympathetic to this approach, although starting with the "essential" terminology may prove too confusing when trying to deal with various doctrines with diverse sources and evolutions. Perhaps simply referring to "public utilities" or "common carriers" or even appealing to broader "public interest" goals can avoid allowing the debate to be drawn too far into the realm of pure antitrust.

Many recent flashpoints in communications law have centered on whether and how carriers may discriminate between communications they carry. On one end of the spectrum, the government would mandate that carriers openly share or provide access to competing providers, charging the government-determined marginal cost. This is the approach taken by many European countries. On the other extreme, carriers would be permitted to treat their lines as pure private property – charging, degrading, or blocking whomever they wish. In the *Brand X* decision and the subsequent FCC rulings, the United States has largely taken a private property approach.[135]

The first round of internet-era debate over network discrimination took place over so-called "open access" rules which would require American carriers to share their physical infrastructure—all the way down to consumer household connections—with their competitors. This argument relied in part on the assumption that robust competition in that market would be unlikely in the short term, because there were few technologies that could reach all the way to the home. It also relied in part on the argument that as infrastructure, it should inherently be open to all-comers. In any event, the *Brand X* decision ended this debate. Carriers would not be required to share their broadband infrastructure with competitors. After winning this decision, the FCC released a non-binding policy statement, which has come to be referred to as the "Four Freedoms" statement. It states, in part,

- . . . consumers are entitled to access the lawful Internet content of their choice.

[135] Although *Brand X* itself acknowledged that there are ongoing proceedings that address limitations on carrier conduct, the general thrust of the decision defers to the FCC's judgment that carriers should be free to do as they wish.

- . . . consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.
- . . . consumers are entitled to connect their choice of legal devices that do not harm the network.
- . . . consumers are entitled to competition among network providers, application and service providers, and content providers.[136]

At first glance, this sounds like a strong endorsement of the general right of users to access and use the network.[137] However, the Commission included a substantial pair of caveats in a footnote at the end of the statement, which read, ". . . we are not adopting rules in this policy statement. The principles we adopt are subject to reasonable network management."[138] The allowance for "reasonable network management," and the fact that the policy statement did not bear the force of a formal rulemaking, opened a second round of debate in the broadband non-discrimination battle. This time the question was whether the carriers, which had won the right to exclude other internet providers from their networks, could extend this practice to discriminate between the various content types and sources traveling over their exclusive lines. Some internet content providers would benefit from higher-priority transport, and the carriers reasoned that they could extract more profits from these companies while also solving their persistent network

[136] FCC 05-151, "Policy Statement," 20 FCC, Rcd 14986 (2005) 3.

[137] It is important to note that these four principles, even without the caveats, do not clearly grant the right to non-discriminatory access. Commissioner Michael J. Copps echoed the call of several neutrality advocates in his comments on the Comcast Order, saying that the Commission should adopt a "fifth principle of non-discrimination" (1 Aug. 2008 <http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-183A3.pdf>).

[138] FCC 05-151, n. 15.

congestion problems. Critics replied that such practices would violate fundamental principles of communications law and the spirit of the internet. The issue had become known as "network neutrality."[139] Critics were awakened when former SBC CEO Ed Whitacre famously commented,

> Now what they [content providers] would like to do is use my pipes free, but I ain't going to let them do that because we have spent this capital and we have to have a return on it. So there's going to have to be some mechanism for these people who use these pipes to pay for the portion they're using. Why should they be allowed to use my pipes? The Internet can't be free in that sense, because we and the cable companies have made an investment and for a Google or Yahoo! or Vonage or anybody to expect to use these pipes [for] free is nuts![140]

A coalition organized by the non-profit group Free Press, fired back:

> The SavetheInternet.com Coalition launches April 24 to urge Congress to take immediate steps to save the First Amendment of the Internet — a principle called "network neutrality" that ensures that the Web remains open to innovation and progress. Congress is about to vote on a bill that would ruin network neutrality by letting big phone and cable companies set up toll booths along the information superhighway. Companies like AT&T, Verizon and

[139] Wu, "Network Neutrality" 141-179.

[140] Ed Whitacre, qtd. in "At SBC, It's All About 'Scale and Scope,'" *Business Week*, 7 Nov. 2005 <http://www.businessweek.com/@n34h*IUQu7KtOwgA/magazine/content/05_45/b3958092.htm>.

Comcast are spending tens of millions in Washington to kill any protection of the free and open Internet.[141]

Ed Whitacre's comments and the Save the Internet Coalition staked out two poles in the debate. Because broadband had become regulated as a vague "Title I" carrier, and because the FCC's policy statement did not bear the force of a formal rulemaking, there was a great deal of room for debate. Network neutrality differed from traditional common carriage in an important way. In the past, carriers did not have the practical capability to examine the contents of what they were transporting and to then discriminate accordingly. Railroad operators could not open every piece of cargo to determine whether or not they might be able to extract more income from the sender or manufacturer. Circuit-switched telephone operators devoted an entire circuit to the caller, without the ability to throttle bandwidth or charges based on content.[142] This all changed in the era of broadband, in which all packets became aggregated together and technology for the first time permitted fine-grained discrimination. The question now is whether or not carriers should be legally prevented from exercising this discretion, which in the past was prevented as a practical matter. The issue has been largely framed in terms of free speech principles, economic arguments, and the internet ethos.

1. Free Speech

Those arguing in favor of a non-discrimination rule often emphasize that open democratic discourse relies on equal freedom to speak. If large companies are permitted

[141] Free Press <http://www.savetheinternet.com/blog/2006/04/19/act-now-to-save-the-internet/>.

[142] Furthermore, they were legally prevented from differential charges based on the phone numbers called according to the FCC's *Computer II* rules.

to choose who can communicate in what fashion, they claim, this freedom would be at risk. In a post-*Brand X* environment, where the carriers maintained exclusive control over their near-monopoly networks, these critics have grown concerned that these large companies would forfeit free speech in favor of more profit. For example, Barry Steinhardt of the ACLU's Technology and Liberty Program stated in June of 2008 that, as opposed to their early victory against Congressional censorship in *Reno v. ACLU*, "No longer is the government the greatest threat to free speech online. The threat is now the companies that run the pipes."[143] Some of these arguments resemble traditional criticisms of broadcast media: consolidation has put too much power into the hands of relatively few. On the other hand, the non-discriminatory internet functions very differently from broadcast media. Anyone can speak without a license, and communication is inherently two-way. Whereas in the broadcast era the free speech arguments took place at the level of content, internet non-discrimination most often takes place at the transport layer.

There is also a free speech argument *against* non-discriminatory rules.[144] The carriers consider any government intervention to be a threat to *their* right to speak. Why, they argue, should the state be dictating what they can and cannot do on their own networks? To be sure, there is a strong precedent for non-intervention in print media. There has never been a requirement on newspapers to publish anything that somebody wanted published, and especially not that they charge the same rates to everyone.

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[143] Barry Steinhardt, qtd. in <http://www.openmarket.org/2008/06/10/net-neutrality-a-civil-liberty/>.

[144] See, for example, Randolph May of the Free State Foundation's comments in "Broadcasting & Cable," 9 Aug. 2008 <http://www.broadcastingcable.com/index.asp?layout=talkbackCommentsFull&talk_back_header_id=6372794&articleid=CA6372794.>.

Furthermore, by now broadcast regulation has repeatedly surrendered ground on first amendment challenges.[145] In an era of competition, they argue, even the weak force of scarcity-based doctrine cannot overcome their first amendment rights.[146]

2. Economic Arguments

As the network neutrality debate has evolved, economic analysis has also come to the fore. Opponents of neutrality rules emphasize the competition focus of the 1996 Act and its emphasis on market forces in order to foster growth and deployment of new communications technologies. Instead of a crippling network neutrality mandate, argues Christopher Yoo, the government should remain hands-off and encourage "network diversity."[147] According to him, "The central focus of broadband policy should be on how best to foster competition in the last mile."[148] The theory is that when carriers are allowed to experiment with business plans (and network discrimination), the market will

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[145] Jonathan Weinberg, "Broadcasting and Speech," *California Law Review* 81 (1993): 1103-1206.

[146] Commissioner Robert M. McDowell brazenly made this argument on August 12, 2008. Absurdly conflating broadcast notions of public interest and network notions of non-discrimination, he said, "I think the fear is that somehow large corporations will censor their content, their points of view, right. I think the bigger concern for them should be if you have government dictating content policy, which by the way would have a big First Amendment problem. Then, whoever is in charge of government is going to determine what is fair, under a so-called 'Fairness Doctrine,' which won't be called that – it'll be called something else. . . . So, will Web sites, will bloggers have to give equal time or equal space on their Web site to opposing views rather than letting the marketplace of ideas determine that? (Jeff Poor, "FCC Commissioner: Return of Fairness Doctrine Could Control Web Content," Business & Media Institute, 12 Aug. 2008 <http://www.businessandmedia.org/articles/2008/20080812160747.aspx>). McDowell may well have been taking his cues from Adam Thierer, of the think tank Progress and Freedom Foundation, who published a more lengthy but no more well-reasoned argument equating network neutrality and the fairness doctrine in October 2007 (Adam Thierer, "A Fairness Doctrine for the Internet," City Journal 18.3 (18 Oct. 2007) <http://www.city-journal.org/html/eon2007-10-18at.html>.) Thierer similarly fails to explain how mandated content carriage under the doctrine parallels non-discriminatory transport obligations, preferring to simply assert that it is so. It is hard to understand why, if network neutrality were just another version of the fairness doctrine, we should not refer to all Title II common carrier obligations as "the fairness doctrine." Plainly we do not, and this has not even occurred to policymakers in the several decades of their co-existence – with good reason.

[147] Christopher S. Yoo, "Beyond Neutrality," *Harvard Journal of Law and Technology* 19 (Fall 2005) <http://ssrn.com/abstract=742404>.

[148] Yoo 9.

surface more competitors and the most efficient technologies. A variety of this argument says that last-mile providers need discriminatory freedom in order to earn returns that incentivize them to build out next-generation networks. Discrimination on the transport layer is therefore beneficial. The only check on this behavior, according to this school of thought, should be antitrust-like competitive analysis. Furthermore, even in the case in which most consumers are left with a local monopoly, neutrality opponents argue that the carriers will not have the incentives to discriminate "inefficiently" (although they may very well discriminate).[149] These scholars generally would like to see telecommunications regulation be turned into a sort of *ex post* antitrust analysis,[150] although they admit that antitrust courts may be ineffective at enforcing even that.[151] The solution is therefore to re-invent the FCC to be an antitrust-focused light-touch regulatory agency.[152]

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[149] Joseph Farrell and Philip J. Weiser, "Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age," *Harvard Journal of Law and Technology* 17.1 (2003): 85-134. Farrell and Weiser argue that carriers lack the incentives to discriminate because of a feature they call "Internalizing Complementary Efficiencies." According to their analysis, carriers benefit when there is a flourishing of different content and applications riding on top of their networks (and they charge monopoly rents for network access). This is nevertheless subject to several exceptions, including the fact that carriers may simply not know what is best for them. Barbara van Schewick outlines several additional exceptions to this principle that are especially relevant in the internet context. These exceptions are further broadened in an environment in which the access provider can subtly discriminate without blocking altogether ("Towards an Economic Framework for Network Neutrality Regulation," *Journal of Telecommunications & High Technology Law* 5 [2007]:329-391). -In general, the criteria of "inefficient" behavior in the "ICE" analysis boils down to whether or not the monopolist is achieving the highest possible profit from the consumer (with the assumption that this maps cleanly to greatest consumer welfare). In any event, the broadband market is increasingly a weakly competitive duopoly, which undermines "ICE" behavior.

[150] Farrell and Weiser 134.

[151] Yoo 69.

[152] In 2005, the Progress and Freedom Foundation think-tank proposed the "Digital Age Communications Act (S.2113), sponsored by Jim DeMint (R-SC). "In brief, DACA adopts an 'unfair competition' standard which is based on competition law and economics and which is robust enough to deal with truly anticompetitive instances of exclusion on the Internet, but without prejudging business practices that may spur investment and deployment of new facilities and services. DACA's case-by-case approach to Network Neutrality is superior, because it avoids thickets of ex ante rules while maintaining the availability of ex post relief" (DACA Regulatory Framework Working Group,< http://www.pff.org/issues-

A second economic argument states that network neutrality is essentially a recapitulation of the failed policy of common carriage. Bruce M. Owen claims that regulatory structures are inherently subject to capture, which generates unworkable inefficiencies.[153] Owen's retelling of history is remarkably selective. With little analysis, he concludes that over a century of railroad common carriage regulation resulted in "a series of highly discriminatory and dysfunctional regional transport cartels," and describes telecommunications common carriage in the context of the drawn-out U.S. v. AT&T antitrust proceedings in the early 1980's. Of course, the AT&T proceedings are not so much a result of common carrier regulation as they are a complicated set of decrees based on antitrust analysis. This is ironic, because Owen too proposes antitrust as an ultimate safeguard. He also seeks to write off the *Computer Inquiries*, the series of FCC proceedings which defined the different roles of regulators with respect to content versus transport. Whereas many scholars believe that the *Computer Inquiries* facilitated the flourishing of dial-up internet,[154] Owen inexplicably asserts that they ended in "morasses of complex, unworkable, and ineffective or self-defeating regulations."[155] In

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pubs/communications/other/031707dacastmt.pdf>). This antitrust-only style of thinking extends beyond the now-dormant DACA group and is echoed by Philip J. Weiser and Robert D. Atkinson, who claim that "In order to ensure that broadband providers do not abuse their market power, Congress should charge the FCC with the responsibility of overseeing the use of discriminatory access arrangements to make sure that any such arrangements do not harm competition (and consumers) (*"*A 'Third Way' on Network Neutrality, 30 May 2006 <http://www.itif.org/index.php?id=63>). I address this school of thought in more detail in section III.2.

[153] Bruce M. Owen, "The Net Neutrality Debate: Twenty Five Years after United States v. AT&T and 120 Years after the Act to Regulate Commerce," John M. Olin Program in Law and Economics, Stanford Law School, Working Paper no. 336 (Feb. 2007) http://ssrn.com/abstract=963623;repub. with minor changes and no footnotes as "Antecedents to Network Neutrality," *Regulation* 30.3, The Cato Institute (Fall 2007).Similar reasoning, and a similar mis-reading of the AT&T divestiture can be seen at <http://techliberation.com/2008/04/18/what-did-he-say/>.

[154] See, for example, Robert Cannon, "The Legacy of the Federal Communications Commission's Computer Inquiries," *Federal Communications Law Journal* 55 (2003): 167-206.

[155] Owen, *The Net Neutrality Debate* 8.

any event, he fails to support his equally vague assertion that neutrality rules necessarily imply the entire common carriage apparatus.

A third economic critique of network neutrality rules comes from C. Scott Hemphill, who argues that network neutrality is in fact different from common carriage in an important way. According to him, network neutrality is a "zero price rule" that restricts carriers from the natural market practice of extracting maximum profit directly from those who use their networks.[156] Hemphill claims that even if one considers common carriage to be a success historically, network neutrality is different in this regard and therefore less economically efficient. The inefficiencies in network neutrality arise, according to him, because carriers cannot directly extract rents from content providers and must instead extract them indirectly from end users. However, in reality carriers *do* earn profit from content providers indirectly via interconnection agreements – a fact that Hemphill briefly acknowledges in a footnote but does not consider further.[157] Carriers enter contracts on two sides of the market: one set of contracts is with their end-users and the other is with internet backbone providers. The backbone contracts are known as *peering* or *transit* agreements, and such agreements have existed since the dawn of the commercial internet. These agreements contain detailed information about how much traffic will be delivered with what quality of service. The internet backbone market is

[156] His analysis is in fact deeper than this and involves delineating between exclusion and extraction. He concludes that exclusion is unlikely because it is not in the carriers' economic interest. While exclusion and extraction are indeed distinct incentives, they are inextricably linked in a discriminatory environment. Last-mile providers do not necessarily choose just one or the other, and, in any event, discrimination incentivized by one might well cause the other. For example, successful extraction may well necessitate ongoing discrimination. Ultimately, this behavior can have the effect of preventing successful market entry or profitability for those discriminated against. Even if such behavior does not cripple those entities entirely, the practice enables the last-mile provider to introduce distortions in the market. Van Schewick explains that carriers have the ability and incentive to discriminate in this fashion (p. 346).

[157] Hemphill n. 4.

unquestionably competitive.[158] These backbone providers then interconnect either directly with the content providers, or indirectly through other carriers. This is what makes the internet a "network-of-networks." Hemphill ignores this market structure, concluding that last-mile providers should be free to negotiate directly with content providers, despite the fact that they have no direct commercial relationship with them. Yoo similarly conflates these markets.[159] However, if last-mile providers were permitted to discriminate based on the source or content of particular traffic as a way of extracting more profits, they would in fact be leveraging their local duopoly market power into the competitive internet backbone market.[160] Furthermore, they would be extracting profits

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[158] However, even this competitive landscape is not assured. Kevin Werbach notes, "With changes in the backbone market, however, the traditional peering equilibrium could break down. The centripetal dynamics at the physical layer of the Internet operate effectively because there has been no truly dominant backbone. However, the possibilities for new arrangements are more acute today. . . . Consider one such scenario. AT&T and Verizon are today the dominant Internet backbones. They are among the largest backbones in terms of traffic and geographic coverage, but, more important, they are the only large backbones to also control last-mile connectivity in significant parts of the country, and to have large numbers of retail broadband subscribers. Verizon and AT&T might establish a 'Tier 0' peering relationship with one another, and refuse to offer such peering to other backbones, even those today considered 'Tier 1' peers" ("The Centripetal Network: How the Internet Holds Itself Together, and the Forces Tearing it Apart," *UC Davis Law Review* (2008), pending <http://ssrn.com/abstract=1118435>).

[159] "Indeed, there is no reason to expect that network owners will only attempt to engage in price discriminate vis-à-vis end users. In a two-sided market, network owners are just as likely to try to price discriminate with respect to content and applications providers as well." (Christopher S. Yoo, "Neutrality and the Economics of Congestion," *Georgetown Law Journal* 94 [June 2006]: 1903 http://ssrn.com/abstract=825669). He also diagrams the two-sided network provider market as extending from end-users to content/applications providers: Christopher S. Yoo, "What Can Antitrust Contribute to the Network Neutrality Debate?" U. of Penn., Institute for Law & Economics Research Paper no. 07-11, 513 http://ssrn.com/abstract=992837.

[160] Yoo admits that the last-mile market is concentrated. "Were network neutrality designed to promote competition on the side of the market in which last-mile providers meet end users, the market would be local in scope and sufficiently concentrated to provide an arguable basis for regulatory intervention" (Yoo, "What Can Antitrust Law Contribute 514"). However, he attempts to define the market nationally, claiming that the relevant scope is the field of all national broadband providers. According to his analysis, no single broadband provider would be able to make a content/application provider completely non-viable by blocking access in its region. To begin with, network neutrality proposals do of course address the last-mile to the extent that consumer choice in the last mile is directly affected. Furthermore, antitrust analysis has never sanctioned anticompetitive practice on the condition that the firm being harmed simply remains viable. The case Yoo cites is *Time Warner v. FCC*, 240 F.3d 1126, (D.C. Cir. 2001), but in that case the court considers viability "independent of concerns over anticompetitive conduct" (p. 1133). Regardless, the content/application provider cannot go to one of the other national providers to reach the affected customers. Those providers are not competitors for those customers. If his reasoning held, one might just

from a party with whom they have only an indirect relationship – precisely what Hemphill claims is inefficient.

3. Internet Informed Policy

What most of these anti-neutrality economic positions have in common is that they reduce the analysis almost entirely to antitrust considerations.[161] Antitrust is concerned first with static conditions of competition, and at times the somewhat more

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as well include all international broadband providers as well, making for a very rosy picture indeed. Yoo also notes, "Network neutrality is not, however, designed to promote competition on [the consumer] side of the market. Instead, its focus is to protect competition on the side of the market in which last-mile providers meet content and applications providers." (Yoo, "What Can Antitrust Law Contribute?" 514). Aside from the fact that last-mile providers do not "meet" the content/application providers at all (as I noted above), this is beside the point: network neutrality is designed (in part) to make up for market failures, not to create new transport-level competition. This is where neutrality rules differ from open access rules of the sort that were denied under *National Cable & Telecommunications Association v. Brand X Internet Services*. There is no reason that the government could not simultaneously take steps to encourage further last-mile market entry in other ways. Of course, this market entry is by no means guaranteed, despite Yoo's insistence for several years that it was just around the corner if only it were encouraged. Indeed, much-lauded efforts such as Broadband over Power Line (BPL) have largely failed. This lends credence to the idea that even if last-mile service is not a natural monopoly, it is prone to remain relatively non-competitive in the medium term. Wireless internet seems to be the most viable potential competitor, but the competitive benefits are mitigated by the fact that the two largest wireless companies are sister-companies of incumbent wireline companies. Furthermore, we are unlikely to see anything approaching today's broadband speeds until there is widespread deployment of now-nascent 4G networks. In short, the local last-mile is the appropriate market for antitrust analysis, it is concentrated, and likely to remain so for some time.

[161] Nuechterlein perhaps makes this point most forcefully, when he says, "the net neutrality controversy is best understood as a classic antitrust dispute about 'vertical leveraging,' and the institutions most likely to appreciate the economic complexities of that dispute are the nation's specialized antitrust agencies" ("Antitrust Oversight" 5). This statement assumes that "classic" understandings of competition are the best match for the internet economy. It also assumes that any neutrality concern can be understood only as a "vertical leveraging" question and that antitrust adjudication could provide timely, beneficial, and determinate solutions. The roughly parallel example of the Microsoft litigation took more than 5 years from conduct to remedy. Nuechterlein writes off other neutrality justifications as merely advancing a "populist vision of the internet as a massive leveler of economic inequality" (p. 16) that seeks to "conform the Internet to some utopian vision of an electronic town hall where anyone is guaranteed to speak as loudly as anyone else" (p. 17). He cites political rhetoric about the internet being an enabler for a diversity of business, but claims that different other economic realities (such as the ability to pay for competitive services such as Content Delivery Network delivery) obliterated this ideal long ago. Whether or not access gatekeepers should be permitted to artificially exacerbate this inequality is not addressed. In any event, he claims that any neutrality claims are at their core about market power and market failure, which should always be addressed through antitrust mechanisms. He believes that public interest mandates are "infinitely malleable" (p. 23) and "conceptually empty" (p. 39). However, it is unclear how relatively static "classic" antitrust principles would preserve space for dynamic innovation of applications and content – regardless of whether such innovation were valued on the basis of equality of opportunity or long-term economic growth.

dynamic notion of "Schumpeterian" competition (which I discuss further in Section III). As doctrines like "essential facilities" fall out of favor, and more complex "network" or "platform" analyses are still in their infancy, one must consider whether antitrust alone is up to the task of standing in for broader notions of "the public interest."[162] Indeed, FTC Commissioner J. Thomas Rosch has expressed precisely this type of concern:

> [A]s an agency focused on consumer protection and competition, I believe the FTC has a role to play in broadband and Internet markets. At the same time, I recognize that there are other perspectives of equal and even greater importance. Internet access, like access to traditional forms of media and communication, touches on broader public policy goals than economic efficiency which has become the touchstone of antitrust law.[163]

Network neutrality advocates have considerable economic firepower on their side as well. To begin with, they engage antitrust analysis on its own terms, pointing out the highly concentrated nature of last-mile access. However, many neutrality proponents believe that antitrust (at least as practiced in the United States) can become an excuse for doing nothing. Economists and lawyers seem to come up with endless ways of slicing the relevant markets to support their particular conclusions. For example, the FCC itself has been heavily criticized for its definition of the "broadband market."[164] The phrase

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[162] Barbara A. Cherry adds to this critique by reminding us that antitrust was never the justification for non-discriminatory law in the first place and that the obligations first flowed from common law, which was subsequently adopted into various statutory embodiments (and are now being undone in the name of "deregulation"). ("Back to the Future: How Transportation Deregulatory Policies Foreshadow Evolution of Communications Policies," *The Information Society* 24.5 (2008), pending.

[163] J. Thomas Rosch, "Broadband Access Policy: The Role of Antitrust," Broadband Policy Summit IV: Navigating the Digital Revolution, Washington, DC, 13 June 2008..

[164] In particular, the FCC has included relatively slow connections in its broadband statistics and has refused to release its non-aggregated data to the public. (See U.S., GAO, "Telecommunications: Broadband Deployment Is Extensive Throughout the United States, But It Is Difficult to Assess the Extent

"free market" can become a euphemism for "never regulate."[165] More fundamentally, neutrality advocates emphasize that the economics of broadband do not conform to traditional notions of firm-based competition. Instead, much economic growth and innovation flows from diverse user production.[166] On the internet, users become producers, and the individual on a cable modem might invent the next web success story. In this case, the economic analysis focuses instead on how well infrastructure providers facilitate the myriad welfare-enhancing activities of network users. This relies not on turn-of-the-twentieth-century notions of industrial economics but rather on contemporary "emergence economics" that treats networks as agent-driven complex adaptive systems.[167] Emergence economics does not assume that all entities have perfect knowledge of the market or that every profit is completely captured. Furthermore, it treats this as a beneficial feature that feeds networked growth. The more users and the more uses that are allowed, the more economic production and social welfare is generated. I will discuss this in more detail in Section III.2.

Neutrality advocates point out that network discrimination wrests control out of the hands of users or content/application providers and places it in the hands of the

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of Deployment Gaps in Rural Areas," 10 [2006] <http://www.gao.gov/new.items/d06426.pdf>; S. Derek Turner, "Broadband Reality Check II: The Truth Behind America's Digital Decline," [2006] <http://www.freepress.net/docs/bbrc2-final.pdf>). The Commission has subsequently changed the way it reports broadband deployment data going forward, but this may simply provide more fodder for the pundits (*Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership*, WC Docket No. 07-38, Report and Order and Further Notice of Proposed Rulemaking, FCC 08-89 [rel. 12 June 2008]).

[165] This tendency appears strongly when scholars focus narrowly on the most extreme Chicago School analyses. Such myopia fails to recognize the many "externalities" present in network economies. Frischmann and Van Schewick take Yoo to task for precisely this reason. (Brett M. Frischmann and Barbara van Schewick, "Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo," *Jurimetrics* 47: 409-420, pending.)

[166] See, e. g., Frischmann and Lemley.

[167] Whitt and Schultze.

carriers. They challenge the notion that network providers are best suited to choose which uses of the network should be prioritized or to predict what future uses will be most economically beneficial. Discrimination, as opposed to outright blocking, can be particularly damning to innovative new uses. For example, slower treatment of certain Voice-over-IP traffic, peer-to-peer traffic, or "lower tier" web sites can make them unattractive or even unusable. This may all take place without the user's knowledge and may even shield the network provider from customer backlash.[168] Discrimination sacrifices the yet-unknown uses and innovations of the users for the short-term known interests of the carrier.

Fundamentally, most pro-neutrality economic arguments view the internet as infrastructure. Sometimes this view is articulated in the context of economic analysis,[169] but it is also described as an internet norm. Early open access and network neutrality debates often came to a head over what is called the "end-to-end" principle.[170] The simplest version of this principle states that end-users should control what they transmit, and the network operators should deliver these communications in best-efforts fashion. The design of the Internet Protocol, with its layered structure, has permitted users to invent new applications and protocols on top of the "dumb" network.[171] This design principle has been the norm since the beginning and has led to engineering and social expectations that carriers do not dictate the terms of use.

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[168] Van Schweick, "Towards an Economic Framework."

[169] Waller and Frischmann.

[170] Mark A. Lemley and Lawrence Lessig, "The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era," *UCLA Law Review* 48 (2001): 925-972.

[171] David Isenberg, "The Dawn of the Stupid Network," *ACM Networker* 2.1 (Feb./Mar. 1998): 24-31.

The "netheads" have a radically different set of expectations than the phone or cable company. The wireline operators for the most part designed intelligence "into" the network rather than place it at the "edges." The circuit-switched phone network is a prime example. Phone users traditionally received new features only when the phone company chose to offer them, and those services were operated by the phone company. The content available on cable television has always been programmed by the cable company, typically with a limited set of take-it-or-leave-it channel packages. Early dial-up internet represented a creative hack. Only with the help of common carriage, the *Computer Inquiries*, and *Carterphone* was the internet able to survive on top of the highly controlled telephone network. As users migrated to broadband and other forms of convergence took hold, the technology and regulatory structure no longer ensured peaceful co-existence. This led to what some have called the "nethead vs. bellhead" confrontation.[172] This difference of principles undoubtedly exists, and network neutrality is a key battleground.

However, upon further inspection the dichotomy need not be absolute. Even early internet engineers admit that absolute end-to-end neutrality has never existed. In the early days of the internet's predecessor, the NSFNet, it was necessary for a period of time to prioritize terminal sessions that demanded low latency versus file transfers that demanded high throughput.[173] Today, network operators intervene to block spam or viruses. If the government can identify and enforce cases in which end-to-end use should

[172] Indeed, a 2004 conference of the same name sought to bring together telecom lawyers and internet advocates (some of whom were also lawyers). See http://www.cardozobellhead.net/.

[173] Jeffrey K. MacKie-Mason and Hal Varian, "Economic FAQs about the Internet," *The Journal of Economic Perspectives* 8.3 (Summer 1994): 75-96 <http://hdl.handle.net/2027/spo.3336451.0001.110>.

give way to certain types of socially beneficial network management, then there may be a productive compromise between "netheads" and "bellheads."

My perspective is that the policy dialogue is skewed too far in favor of carrier discretion. The radical turn toward competition-only policy in the last twenty years, and the difficulty of clearly defining what makes for "reasonable network management" (in the words of the "Internet Freedoms" policy statement), leads many policymakers to throw up their hands and defer to the market. However, our understanding of "the market" has fallen far behind networked market realities. Antitrust is ill prepared to explain the economics of user-based production, multi-sided markets, platform economics, and network effects. The proposal that we suspend *ex ante* rulemakings in favor of *ex post* enforcement from an agency structure that does not yet exist seems like a recipe for doing nothing at all. In any event, such a structure is likely to create confusion and indeterminacy in the market.[174] The FCC is currently attempting to navigate this

[174] Jonathan E. Nuechterlein and Philip J. Weiser note that "The more basic problem with relying on antitrust courts to superintend the telecommunications industry is that the judicial process is deficient in the areas of determinacy and expertise. Consider determinacy first. Companies with market power need to know now, not at the end of a multi-year antitrust suit, whether the aggressive business strategy they are contemplating will subject them to treble damages under the Sherman Act in the future" (rlein and Philip J. Weiser, "First Principles for an Effective Rewrite of the Telecommunications Act of 1996," AEI-Brookings Joint Center for Regulatory Studies Working Paper 05-03 (Mar. 2005): 27 <http://ssrn.com/abstract=707124>). The authors go on to explain that nevertheless, the current FCC procedures generate indeterminacy because of inevitable politicization of the process and extended rulemakings or adjudication. Two years later, in comments to the FCC co-authored by Nuechterlein, AT&T claims that "the quick resolution of the Madison River controversy confirms that ex post remedies, including antitrust actions, are more than adequate to deal with the threat of any recurrence" (*Reply Comments of AT&T Inc.,* 17 July 2007, WC Docket No. 07-52). The "Madison River controversy" refers to a case in which the FCC acted against anticompetitive discrimination by ISP Madison River (resolved in *Consent Decree*, FCC DA 05-543). Given the fact that this action took place under the Title II common-carrier provisions, which under the *Brand X* decision may no longer apply, it is hard to understand why this example adds any level of certainty to enforcement. In any event, AT&T claims, "the common-carrier-type 'nondiscrimination' rules favored by some net neutrality advocates would chill the free-wheeling experimentation at the heart of the Internet's success and would embroil the industry in years of indeterminate litigation about the reasonableness of highly technical network-management decisions made in a rapidly evolving business environment" (*Comments of AT&T Inc.,* 15 June 2007, WC Docket No. 07-52). It is far from clear that antitrust-like adjudication, even the imagined expedited system of DACA or its variants, would perform better. More likely, the effect of this line of reasoning is resistance of any

difficult in-between space by enforcing its policy statement on an *ad hoc* basis. The Commission faces jurisdictional and merit-based challenges, and it is hard to imagine the current process being sustainable in the long run.[175] The initial round of proposed network neutrality legislation may have been too blunt a tool for fashioning the appropriate "reasonable network management" safeguards, but future efforts could prove more viable. Ideally, statutes should provide a guide to regulators who institute the more refined rules adaptive to the conditions at hand. Currently, the Commission is operating without a map.

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enforcement whatsoever. The claim that pure antitrust can do a better job is at best speculative and at worst a red herring.

[175] Indeed, this blossomed into an all-out regulatory brawl in the summer of 2008, when Comcast and its opponents traded arguments in public comments in FCC Docket 07-52. Free Press had filed a complaint against Comcast, alleging that the company blocked peer-to-peer traffic in violation of the Commission's Policy Statement. Comcast argued that the policy statement did not constitute enforceable rules and as such was arbitrary and capricious. They noted Chairman Martin's own comments upon voting for the Policy Statement in 2005, in which he stated that "policy statements do not establish rules nor are they enforceable documents" (see http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-260435A2.pdf). Comcast also argued that the Commission did not have the right to act under its broad "Title I" jurisdiction. Free Press pointed out that at that very same moment, Comcast was claiming in Federal court that the FCC was the *only* entity with the jurisdiction to act. It further explained that the Commission has long made rules through case-by-case adjudication and without explicit rules. They also pointed out many potential statutory sources for authority to act. One of the most interesting components of this debate nwas the fact that Comcast argued that the Commission did not have jurisdiction under the 1979 case *FCC vs. Midwest Video Corp* (440 U.S. 689). In that case, the Court decided that the FCC could not impose what amounted to common carriage obligations on cable companies because they were functionally equivalent to broadcasters and statute had not yet given the Commission explicit authority to regulate cable: ".Congress has restricted the Commission's ability to advance objectives associated with public access at the expense of the journalistic freedom of persons engaged in broadcasting. . . . The Commission may not regulate cable systems as common carriers, just as it may not impose such obligations on television broadcasters" (*Midwest Video* 706, 709). It is not clear whether this type of reasoning still holds in light of the Cable Act, Section 230 of the Communications Decency Act, other statutory changes since 1979, or the general evolution of cable technology away from broadcast-like operations. On August 1, 2008, the Commission voted 3-2 to discipline Comcast in "trust-but-verify" fashion – it would not impose a fine but would instead monitor Comcast's promise to implement a "content agnostic" traffic management system. On August 20, 2008, the Commission released its formal order. The order took the "kitchen sink" approach to its jurisdiction, citing authority from "sections 1, 2(a), 4(i), 4(j), 201(b), 230(b), 256, 257, 303(r), 403, and 601 of the Communications Act of 1934, as amended, 47 U.S.C. §§151, 152(a), 154(i), 154(j), 201(b), 230(b), 256, 257, 303(r), 403, 521, and section 706 of the Telecommunications Act of 1996" (paragraph 57). Much of the most compelling language about the nature of the internet and the Commission's mandate to preserve that nature draws from §230(b), the remnants of the Communications Decency Act (in particular, the order discusses these elements in paragraphs 12-14). Comcast is expected to appeal the order.

Thomas Nachbar has argued that the ideal non-discrimination rule would prevent *user*-based discrimination but allow carriers to discriminate based on *use*. Under this regime, providers would be able to choose which services they support (and how they prioritize or discriminate among them), but they would be required to offer the same deal to everyone. Google could not pay for faster delivery than Yahoo. He reasons that user discrimination is easier to define than use discrimination and less prone to regulatory abuse. He envisions this user-based neutrality as enforced by "standards" and not law or formal rules.[176] Furthermore, he claims that mandating uniform treatment of all packets would discourage applications that require prioritization or quality of service guarantees, making it a type of discrimination itself. To be sure, networks that treat all traffic uniformly make it more difficult to use certain applications. However, Nachbar's core criticism appears to be not that someone will be choosing how to prioritize, but rather that in some neutrality regimes the government would be choosing. The best entity to choose, on his account, is the last-mile provider.

I disagree. Both *use* and *user* non-discrimination should be policy goals. It makes sound economic sense, it is consistent with historical non-discrimination precedent, and it supports the internet ethos of diverse uses and abundance of peers. Historically, use and user were closely linked, and non-discrimination in one area could ensure non-discrimination in the other. For example, the *Computer II* rules mandated only that carriers not discriminate based on the phone number called. However, because of the simplistic circuit-switched technology (and the *Carterphone* right to attach

[176] It is unclear what these "standards" might be, other than the existing standards within the internet protocol, which have clearly been ignored in cases such as the recent Comcast/BitTorrent back-and-forth. As such, I am not sure what real force they would bring to bear on the situation aside from the unsustainable ad hoc complaint adjudication that the Commission is currently undertaking.

devices), the rules ensured that use-based discrimination would not occur. Today, user-based discrimination protects only against a subset of harms, which in any event might already be addressable under antitrust doctrine.[177] It does not ensure that carriers support applications that they do not think will be profitable, or that compete with their non-internet offerings, or that have not yet been invented. The problem is that surrendering use-based discrimination to last-mile providers would surrender the general-purpose infrastructure in the interest carrier-profit-oriented incentives. In fact, it discriminates against users with business models or non-commercial modes of production that rely on technology uses not approved by the carrier. The technology of the internet presents us with a choice we have not had to make historically because user-based neutrality has always implied use-based neutrality. Nachbar is prepared to give up on use neutrality while I am not.

One way to maintain use-based non-discrimination by carriers would be to place prioritization control in the hands of the users. Most content/application providers have the opportunity to exercise this control by going to any number of competitive backbone providers. Different backbone providers ensure different levels of quality-of-service guarantees for common metrics like latency, throughput, and jitter (at least, up to the edge of their networks). End users, who are accessing this content or these applications or are connecting with each other in peer-to-peer fashion, do not have the ability to choose different prioritization via competitive providers or by specifying preferences to

[177] Of course, given the uncertainty of the applicability of antitrust in this area, these harms might not be addressable under its doctrines. In any event, rules would provide a great deal more clarity when it comes to user-based neutrality.

their provider. Indeed, even across-the-board neutrality may disfavor particular applications users wish to use, although this may be more appropriate and efficient than the last-mile provider's blanket imposition of prioritization. A better solution would allow end-users to easily control the prioritization of their own traffic, within the tier of service that they have purchased from their provider. Such a solution might implement a more sophisticated "Type of Service" style component into some layer of the network protocol, after being defined via a standards group such as the IETF.[178] This approach recognizes that different users have different usage needs and places the control in their hands. It refuses to foreclose on new uses simply because the network owner did not think of them first, and it catalyzes innovation at the "edges." It is not true to absolute neutrality, but it *is* true to fundamental principles of non-discrimination and the internet ethos. From a "free market" perspective, it places knowledge and decision-making capacity in the hands of the entities with the power to make purchase decisions. Such an approach is unlikely to garner initial favor with carriers because it preserves user control,

[178] David Reed stated (FCC En Banc Public Hearing on Broadband Network Management Practice at Harvard Law School, Cambridge, MA [25 Feb. 2008]), "There were a wide range of actual standards that would allow Comcast to manage and prioritize traffic, including diffserv, ECN, RED. . ." (<http://www.fcc.gov/broadband_network_management/022508/reed.pdf>). One might add to this list the RSVP protocol (RFC 2205) and other methods that use flow-based prioritization (such as the method described in John L. Adams, Lawrence G. Roberts, and Avril Ijsselmuiden, "Changing the Internet to Support Real-time Content Supply from a Large Fraction of Broadband Residential Users," *BT Technology Journal* 23.2 (Apr. 2005): 217-231. Some of these tools can be used by network operators to choose their own discriminatory practices, or they might be implemented in such a way as enable user-based control. Early internet engineer David Clark recently remarked (video recording <http://www.fcc.gov/broadband_network_management/hearing-ma022508.html> at 4:24:45), "I don't like the idea of the ISP assigning quality of service to an application. If there is going to be any discrimination in terms of quality of service that's associated with some packets rather than others, I would prefer that the bits which select those packets for enhanced service be set by the user. The user could say 'this telephone call is really important. I want this telephone call to go through.' Imagine that in any given month, ten percent of your traffic could be high priority. You could say, 'this is it, I want it here.' It could be my choice as to whether that's a phone call or a game, or I'm trying to get a bid into eBay or whatever I'm trying to do. I would like the user to be able to assign those priorities. If you look at the way that internet telephony is done today, those bits are set by the phone device. It's not set by the ISP. It's the phone device that says, 'this is a phone call and therefore I will set these bits,' and if the ISP chooses to honor these bits then these packets will go through better. That's something that could be superimposed on top of the basic idea of usage quotas."

because it nevertheless resolves their "congestion" justification, and because it would take more technical and cooperational work than blunt discrimination. The appropriate policy path to this outcome might involve a use-neutrality mandate on last-mile providers with an exception for user-specified, standards-defined prioritization.

A user-based prioritization scheme would require some level of agreement, either via standard or law, that carriers would respect the indications of the last-mile users (presuming the users had paid for such prioritization). This would require agreement on what different quality-of-service flags meant and transparency from the provider about how they implemented such flags. It would require vigilance to ensure that the last-mile providers practices were in keeping with what users believed that they had paid for. This would suggest an ongoing role for the FCC, perhaps with additional competitive safeguards and adjudication aid from the FTC. I believe that this regulatory overhead would nevertheless be worth the overhead because it places market knowledge and decision-making power in the hands of the end-users who are making purchase and access decisions.

The historical roots of the public interest standard remind us that communication infrastructure is special. Protecting against monopolistic abuse is only part of the equation. It is equally important that users are free to conduct business, speak, and innovate on top of that infrastructure. Some form of neutrality-like regulatory safeguard is likely to be the most clear, enforceable, and historically congruent way of achieving this end. In Section III, I will explain how historical principles of the public interest might be transformed in the era of the internet in such a way that policymakers might craft such a rule.

B. SPECTRUM ALLOCATION

For decades, much of the debate over the use of radio frequencies focused on how the government determined which lucky few would obtain licenses to broadcast. As the focus shifted toward two-way radio operations and the nascent cellular phone business, the government continued its policy of giving away licenses based on "comparative hearings." The first round of cellular licenses was allocated in this way, and the Commission chose the existing wireline incumbents.[179] In the years that followed, auctions eventually replaced these "beauty contests" on the Coasian theory that those willing to pay the most for frequencies would also be those most likely to use them efficiently. However, the Commission still had to determine the rules governing the auctions, which would of course influence the outcomes. Meanwhile, another school of thought advocated for the unlicensed use of spectrum on the theory that new technologies made it possible to treat some spectrum as a commons. The current debate over spectrum policy involves weighing the merits of property versus commons approaches, as well as creative solutions in between. The answers depend on how well property-oriented efficiency aligns with the public interest, to what degree technology enables unlicensed use, and even whether spectrum should still be considered scarce.

In 2002, the FCC convened a "Spectrum Policy Task Force" (SPTF) to perform a comprehensive re-examination of how the Commission managed the airwaves.[180] It had

[179] Second Report and Order, An Inquiry into the Use of the Bands 825-845 MHz and 870-890 MHZ for Cellular Communications Systems, 86 F.C.C.2d 469 (1981).

[180] Spectrum Policy Task Force, ET Docket No. 02-135, Report (rel. Nov. 2002) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf>.

become increasingly clear that the traditional "command and control" model, in which the Commission decided precisely how each block of spectrum was used, was not keeping up well with the evolving uses. There was a considerable amount of spectrum left under-used because it was locked into out-of-date usage allocations or controlled by government or commercial entities. The long-held belief in spectrum policy was that the government was justified in deciding who had a right to use this scarce public resource only because it made for more efficient usage. The SPTF investigated various alternatives to the traditional top-down approach and determined that there were at least two ways to make spectrum usage more "flexible" without introducing interference: greater propertization and a variety of unlicensed uses.

1. Property, Commons, and Scarcity

When Ronald Coase first proposed the idea that spectrum should be bought and sold,[181] most thought that his proposal was absurd.[182] Most policymakers at the time saw the spectrum as property of the public, and such privatization offended their sensibilities. Furthermore, Coase argued that even the government and public safety users should have to pay for the spectrum they use. As the theory goes, making licenses more property-like would cause market forces to allocate the scarce resources to those best able to monetize them efficiently – and efficient monetization was the only type of efficiency that existed

[181] Coase.

[182] Thomas 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," *Harvard Journal of Law and Technology* 14.2 (Spring 2001): 335-567 <http://jolt.law.harvard.edu/articles/pdf/v14/14HarvJLTech335.pdf>.

from this economic perspective. This was, after all, the way many scarce resources were allocated:

> But it is a commonplace of economics that almost all resources used in the economic system economic system (and not simply radio and television frequencies) are limited in amount and scarce, in that people would like to use more than exists. Land, labor, and capital are all scarce, but this, of itself, does not call for government regulation. It is true that some mechanism has to be employed to decide who, out of the many claimants, should be allowed to use the scarce resource. But the way this is usually done in the American economic system is to employ the price mechanism, and this allocates resources to users without the need for government regulation.[183]

It was only in 1993 that Congress warmed up to Coase's idea.[184] Comparative hearings had given way to random lottery assignments of spectrum, which were a disaster by all accounts. By this time, faith in markets had spread and the FCC began auctioning some frequencies.[185]

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[183] Coase, 14. Gerald R. Faulhaber and David J. Farber re-state the Coasian argument as such: "The market is a far more powerful and efficient allocator of resources than administrators and bureaucrats can ever be, no matter how knowledgeable and well intentioned. Efficient markets can realize their magic because they are highly decentralized processors of information. Prices are determined by buyers and sellers interacting in the market, to ensure that demand and supply are equated. The ability of the market price to capture all the information regarding supply and demand is far greater than that of a centralized planner no matter how sophisticated their planning and allocation tools" .("Spectrum Management: Property Rights, Markets, and The Commons," AEI-Brookings Working Paper 02-12 [Dec. 2002]: 7 <http://rider.wharton.upenn.edu/~faulhabe/SPECTRUM_MANAGEMENTv51.pdf>.

[184] Omnibus Budget Reconciliation Act of 1993, Pub. L. No 103-66, § 6002, 107 Stat. 312, 379-86 (codified at 47 U.S.C. § 309(j)).

[185] Since that time, the Commission has continued to extend auctions to more and more bands. In 2002, an FCC working paper echoed the fundamental Coase theorem before recommending more extensive propertization of the airwaves: "The current administrative allocation of spectrum has led to shortages and waste. Markets can move spectrum to its highest value use both now and in the future, even as technology and consumer preferences change" (Evan R. Kwerel. and John R. Williams, "A Proposal for Rapid Transition to Market Allocation of Spectrum," U.S. Federal Communications Commission Office of Plans

Most justifications for property-like allocation of spectrum begin by recounting the failures of the previous systems. Around 2000, a group of scholars began arguing for the "commons" approach, starting with this same observation but proposing a radically different solution.[186] They observed that scarcity and interference might be solved by using new technologies that could share the spectrum without external regulation. Pointing to the success of technologies like WiFi, they observed that "smart" devices could intelligently coordinate simultaneous use of the airwaves. They further observed that such use would be even more decentralized than a property-based approach, would preserve space for a variety of uses, and would catalyze innovation in devices. Perhaps most importantly, it would avoid placing a gatekeeper between citizens and their use of the airwaves. Such flexibility of use and user resonated with the internet ethos, and indeed many proponents of this approach advocated for internet-informed approaches to other issues, like as intellectual property.

The Spectrum Policy Task Force ultimately suggested a mixture of property and commons approaches, saying that the Commission should "Expand the use of both the exclusive rights and commons models, and move away from the command-and-control model, with limited exceptions."[187] However, it recommended that generally spectrum below 5 GHz should be delegated for licensed use and unlicensed use above 50 GHz. [188]

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and Policy Working Paper no. 38 [2002].)

[186] Yochai Benkler, "Overcoming Agoraphobia: Building the Commons of the Digitally Networked Environment," *Harvard Journal of Law and Technology* 11.2 (1998): 287–400.; Yochai Benkler, "Some Economics of Wireless Communications," *Harvard Journal of Law and Technology* 16.1 (2002): 25–83;. Lawrence Lessig, *The Future of Ideas: The Fate of the Commons in a Connected World* (New York: Random House, 2001); Kevin Werbach, "Supercommons: Toward a Unified Theory of Wireless Communication," *Texas Law Review* 82.4 (2004): 863–973.

[187] Spectrum Policy Task Force 52.

[188] Spectrum Policy Task Force 38, 39.

Presumably the frequencies from 5-50 GHz were less clear-cut from the SPTF's perspective. The task force was concerned that lower-frequency signals propagate further and are more likely to crowd out or interfere with far-away users. Unfortunately, this limits the likelihood that unlicensed use can evolve into useful long or medium-distance uses.[189] One problem with drawing such lines is the fact that new technologies, innovative business models, or unique spectrum circumstances might make unlicensed use more attractive in bands previously thought to be off limits. Once spectrum is propertized it is very difficult to convert it back to unlicensed use. The SPTF itself admitted that its recommendations were not hard-and-fast rules. In any event, considerably more valuable spectrum has been devoted to exclusive property-like use than to unlicensed use.[190]

Alongside the property versus commons debate, there has emerged a call for the end of scarcity as a rationale for regulating the airwaves. The reasoning is that new technologies have ushered in an era of abundance that obviates the need for centralized governmental decision-making. J. W. Berresford somewhat implausibly argues that because spectrum is not a "tangible thing," the scarcity rationale for regulating broadcast is incorrect as a matter of scientific fact.[191] He furthermore claims that

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[189] For many years since the inception of WiFi, municipalities have tried to deploy free municipal service. There are many reasons why these efforts have largely failed, but one major factor has been the low power and short range of WiFi, which required deployment of far more base stations than would be financially viable.

[190] One exception has been the 3650-3700MHz rules. (Opinion and Order, FCC Document 07-99 [rel. June 7, 2007].) However, unlicensed devices in this band are constrained to be used only outside of various geographical areas (including many metropolitan areas) due to potential interference with other users. This reduces the likelihood of widespread consumer adoption of such devices. Such an allocation demonstrates the Commission's general approach of resorting to unlicensed allocation only when propertization is not viable.

[191] J. W Berresford, "The Scarcity Rationale for Regulating Traditional Broadcasting: An Idea Whose Time Has Passed," FCC Media Bureau Staff Research Papers (2005): 9.

> Perhaps most damaging to The Scarcity Rationale is the recent accessibility of all the content on the Internet, including eight million blogs, via unlicensed spectrum and WiFi and WiMax devices. The Scarcity Rationale, based on the scarcity of channels, has been severely undermined by plentiful channels.[192]

Berresford overlooks the reality that the unlicensed spectrum required to access the Internet is highly scarce compared to its propertized counterpart, and that longer-range technologies like WiMax have no permission whatsoever to operate on unlicensed spectrum (at least at meaningful power levels). Indeed, the fact that some blocks of spectrum are currently fetching billions of dollars at auction indicates that they are scarce enough that corporations value them highly. Indeed, as Faulhaber and Farber note, "If resources are not scarce, if consumers can pick their food off trees that are never exhausted and if there is infinite bandwidth, then there is simply no need to have markets, which have costs to organize, administer and maintain."[193]

It seems clear that scarcity is still a major reality when it comes to radio spectrum. Nevertheless, what we *can* learn from these calls for the end of the scarcity rationale is that the degree of scarcity is not fixed in stone. It relies on policy decisions about the allocation and usage rules on spectrum. These policy decisions influence scarcity-affecting decisions of market actors. A company seeking to optimize its profits will choose who can use "its" spectrum, and how. This allows the gatekeeper to generate a kind of artificial scarcity based upon its private motives. Likewise, new technologies – and whether or not they can be put into use – affect scarcity. In many cases, the move to digitization allows more information to be packed into less bandwidth. Technologies

[192] Berresford 11.

[193] Faulhaber and Farber 8.

may also *introduce* scarcity as they give gatekeepers more fine-grained control. From the perspective of the internet ethos, the question is whether particular regulatory decisions will, on balance, encourage abundance of users and uses.

2. The 700 MHz Auction

For decades, television broadcasters enjoyed a broad swath of highly valuable spectrum. This spectrum was valuable because of its relatively low frequency, which meant that signals could easily travel long distances and permeate buildings. As over-the-air broadcasting has waned, many of these valuable channels go unused. As the United States faces a mandated switch to digital transmission in February 2009 (and a juggling of licensee frequencies), the FCC has recognized a valuable opportunity to re-assign some of this "wasted" spectrum. In the Summer of 2007, the Commission solicited comments on how to auction a portion of this spectrum in the 700 MHz band such that it would be most likely to be used for next-generation telecommunications technologies like wireless broadband.[194]

The politicking was heated, and the proposals were complicated. The Commission had to decide how to divide up the portions to be auctioned, both in terms of frequency width and geographic reach of each license. These seemingly administrative decisions had the potentially to radically affect which entities could viably bid and win licenses – for example, regional or rural wireless providers would not be able to outbid larger companies for nationwide licenses. Issues related to bid disclosure, "package" bidding, "designated entities" credits for underprivileged bidders, and build-out

[194] Report and Order and Further Notice of Proposed Rulemaking, FCC 07-72, (rel. April 27, 2007). In the interest of full disclosure, I worked for Google during the comment period for this proceeding and contributed to research and drafting of some of the relevant comments.

requirements further complicated the lobbying landscape. The complexity of these many decisions leading up to the auction rules makes it clear that there is no such thing as a "pure" auction in which "the market decides." Auction rules are the locus of normative decisions that are influenced by corporate lobbying, public interest concerns, and politics.

In this case, public interest groups teamed up with Google and others to argue that whoever won the spectrum should be required to adhere to certain "openness" conditions.[195] These conditions would require the winning bidder to allow users to operate any devices and applications on its network, as well as require wholesale and interconnection access for competing providers. Despite the fact that the Commission was statutorily prohibited from considering auction revenue when it set the rules, the conventional wisdom was that the Treasury expected them to deliver major funds. Leading up to the release of the rules, leaks indicated that with respect to one of the key "blocks" of spectrum – referred to as the "C" block – the FCC was considering some of the "openness" principles. However, in parallel it was considering a reserve price of $4.6 billion for that block so that if the bidding did not reach that level there would be a new auction without the conditions. Google's CEO Eric Schmidt took the unconventional approach of writing a public letter directly to Chairman Martin, pledging to bid at least the reserve price if the Commission adopted all four "openness" conditions.[196] AT&T

[195] Comments of Google Inc. on WC Docket 06-150 etc. (9 July 2007) http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519548049; Comments of the Public Interest Spectrum Coalition on WC Docket 06-150 etc. (6 July 2007) <http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519540425>.

[196] Ex Parte letter of Eric Schmidt, CEO of Google, 20 July 2007, WC Docket No. 06-160 http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519559297.

and the wireless industry in general replied that Google's proposal was "corporate welfare."[197]

The Commission's final order struck a compromise on many of the issues at stake. [198] The "open devices" / "open applications" rules were adopted, while the more aggressive openness proposals were not incorporated. When bidding concluded months later, it was revealed that Google had indeed bid up to the reserve price on the "C" block but that Verizon had cast the winning bid. Telecommunications analyst Blair Levin quipped that because of the openness conditions on Verizon, "Google is the happy loser."[199] While the news reports were dominated by analysis of which big company really "won," many missed the more fundamental public interest issues at stake.

The openness conditions in many ways mirrored traditional non-discrimination public interest safeguards. The conditions seek to preserve the freedom of users to use the network as they chose and to access it with any device that did not cause harm to the network. The former resembles a weaker form of *Computer Inquiries* application non-discrimination, and the latter condition mirrors the *Carterphone* decision of 1968.[200] There are many potential loopholes in the rules. Indeed, no sooner had the rules been decided than Verizon began lobbying for a weak interpretation and Google began

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[197] Ex Parte letter of Robert W. Quinn, Jr., on behalf of of AT&T, 12 July 2007, FCC WC Docket No. 06-150 <http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519555670>. CTIA, the wireless industry trade group, took out full-page ads in trade magazines with largely the same message.

[198] Second Report and Order, FCC 07-132 (rel. 10 Aug. 2007).

[199] Saul Hansell, "Verizon and AT&T Win Big in Auction of Spectrum," *New York Times*, 21 March 2008<http://www.nytimes.com/2008/03/21/technology/21auction.html>.

[200] Tim Wu, "Wireless Carterfone," *International Journal of Communication* 1 (2007): 389 <http://ssrn.com/abstract=962027>.

counter-lobbying.[201] I described earlier why I think that the combination of common carriage, the *Computer Inquiries*, and *Carterphone* were necessary for an environment that fostered the flourishing of early consumer internet access. In the wireless context, I believe that similar flexibility of *use* is essential to maintaining historical non-discriminatory access in this new medium, as well as preserving the internet ethos that has led to innovation and free speech online.

Thomas Nachbar believes that defining this *use* neutrality is too difficult, that regulators will tend to define it in such a way that it constrains innovation, that the rules will not affect positive behavior anyway, and that the competitive market will better solve any concerns.[202] Undoubtedly, the "openness" conditions in the 700 MHz auction were defined at a high level and were a result of political compromise. Of course, the Commission has long promulgated broad principles or rules to guide industry behavior and then specified particular guidelines or adjudicated on individual bases.[203] Nachbar goes on to claim that the rules were defined "in a specific, technologically dependent formula"[204] and that "imposing use neutrality requires addressing questions of design."[205] This claim is hard to understand, given that the mandate to allow all devices and applications is clearly divorced from particular technologies and indeed are designed to open the possibility to unforeseen technologies. This is the heart of technology: agnostic network modularity. Nachbar would also have us believe that the rules represent only a

[201] Ex parte letter from Richard S. Whitt, Google, WT Docket No. 06-150 (1 Oct. 2007) <http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6519738920>.

[202] Nachbar,80-89.

[203] Elsewhere, Nachbar endorses precisely this approach (p. 90).

[204] Nachbar 81.

[205] Nachbar 88.

weak form of *Carterphone*, which alone will be ineffective.[206] This ignores the full implications of the open-applications provision, which extends the non-discriminatory mandate into the network.[207] It appears that Nachbar and I agree that two-sided openness (user device and network access) would be necessary to encourage meaningful openness, but that we disagree as to whether this can be done through wireless use neutrality.[208] Nachbar instead sees promise in profit-motivated market actors. He makes much of the somewhat competitive wireless carrier market.[209] However, it is clear that carriers all

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[206] "The rules adopt a version of what has become known as 'Wireless Carterfone'" (Nachbar 81).

[207] To be sure, whether or not this is the case could be disputed. Nachbar's narrow interpretation is that the provision only limits "the ability of carriers to prevent consumers from loading and running third applications on those openly accessible devices" (p. 81). Even if the 700 MHz rules as adopted did not effectively mandate use neutrality in the network, this does not mean that the approach should be abandoned altogether but rather that such rules should perhaps be more explicitly defined. I am considerably more hopeful that it is possible to do this than is Nachbar. This is essentially the same question that plays out in the broader network neutrality debate that I discussed earlier.

[208] Nachbar states that "from a consumer standpoint, the product is the combination of device (or application) and carriage" (p. 82). I agree. I remain confused, however, about why he sings the praises of the Computer Inquiries while maintaining that use neutrality is categorically a bad idea. I am not persuaded by the argument that the IP environment is fundamentally different from the circuit-switched environment in such a way that use neutrality is impossible or undesirable.

[209] "But the wireless markets of today are not like the wireline market that AT&T operated in years ago. Today's wireless carriers face 2 competitors in over 90% of their markets, and therefore have far less market power than AT&T did" (Nachbar 82) Nachbar goes on to perform an analysis of the market incentives of wireless operators that I believe is fundamentally flawed on several accounts. He begins by noting the "internalizing complementary efficiencies" phenomenon and claiming that "If wireless carriers actually do have market power, then opening device and application markets to competition will have no effect on their ability to charge monopoly rents" (p. 82). Of course, neither of us thinks that wireless carriers are strict monopolists, and thus the ICE exception is irrelevant. On the other hand, these similarly situated companies sometimes resemble an oligopoly, with strong incentives to leverage market power into adjacent markets. Because they face potential competition on price, speed, and device exclusivity, they are motivated to increase switching costs and customer lock-in. I am puzzled by Nachbar's assertion that "carriers are selling a commodified, undifferentiated service (carriage)"(p. 83), given the ample evidence that carriers are in fact differentiating between content, and Nachbar's own claim that in IP carriers are motivated to differentiate in a way that they were not in the circuit-switched environment. Nachbar then claims that any market power being exercised is likely coming from the device manufacturers instead, citing the iPhone-AT&T tie-up and the fact that the iPhone has lured many customers to AT&T. Of course, one might just as easily conclude that it was precisely the distorted wireless carrier market that motivated Apple to strike the exclusive deal. In any event, despite the perennial appearance of blockbuster devices, the device market is far more diverse and competitive than the carrier market. Furthermore, the device market continues to move toward open platforms of its own accord, with device juggernaut Nokia announcing the open-sourcing of its operating system on the eve of the launch of Google's own free and open source "Android" mobile operating system: "Nokia to Acquire Symbian Limited to Enable Evolution of the Leading Open Mobile Platform," press release 24 June 2008

share similar incentives to discriminate against content and that there is no competitor that offers comparable non-discriminatory service. AT&T recently stated explicitly that its wireless network does not respect network non-discrimination and that its terms of service – "which are similar to those of other wireless providers" – categorically prohibit all peer-to-peer use.[210]

Ultimately, Nachbar's critique of the 700 MHz "openness" rules focuses almost entirely on competition-based analysis of the rules (which, even on its own terms, I consider to be deeply misguided). Missing from his analysis is any consideration of whether the 700 MHz use-neutrality rules map to historical non-discrimination norms. This is odd, considering his masterful exposition of these norms earlier in his paper. Ultimately, the non-discriminatory considerations in the wireless space are parallel to the network neutrality debate overall, and conclusions here are essential the same. As with wireline, wireless operators face genuine network congestion challenges. Content and application-based discrimination is one way of dealing with these challenges. There are many other approaches, including discrimination that is not content or application-based,[211] that do not present so directly a threat to free speech, innovation, and established norms.

<http://www.nokia.com/A4136001?newsid=1230415>; "Industry Leaders Announce Open Platform for Mobile Devices," press release 5 Nov. 2007 <http://www.openhandsetalliance.com/press_110507.html>. Furthermore, it is hard to imagine any leveraging from devices into the network as general-purpose computers increasingly become one of the key devices using wireless internet. Despite such developments, if carriers insist on discriminatory practices, the same bottleneck to innovation remains: use neutrality of government-granted spectrum. Critics of non-discrimination mandates on wireless spectrum raise myriad concerns that such requirements restrict possible business plans. They undoubtedly do. The relevant question is whether or not this benefits or harms overall innovation, growth, and public interest.

[210] Letter from Robert W. Quinn, AT&T counsel, WT Docket No. 06-150 (25 July 25 2008).

[211] Geoffrey Goodell, Allan Friedman, and Scott Bradner, "Scarcity, Discrimination, and Transparency: Understanding Network Management," paper to TPRC 2008 Conference, 27 Sept. 2008, pending.

3. TV "White Spaces"

In contrast to the property-oriented approach of auctions, the FCC is considering an unlicensed approach for another portion of the spectrum previously devoted exclusively to television broadcasting.[212] Although many frequencies below 700 MHz will still be reserved primarily for digital television broadcast, many of the channels will be unused in most parts of the country. New "agile" radio technologies can sense which frequencies are not in use and transmit on only those channels. Many people are hopeful that such technologies could allow next-generation broadband devices to achieve far greater geographic coverage and performance than WiFi. The auctioned property approach might make little sense in an environment in which usage rights depend on opportunistic sharing with primary "owners." Unlicensed access, on the other hand, could make the most of any particular local spectrum availability without complicated licensing and transaction costs.

There are two primary factions in the white spaces debate. The first group, made up largely of public interest groups and electronics manufacturers, advocates for unlicensed use.[213] The second group is the incumbent users of the spectrum – TV broadcasters and wireless microphone users.[214] Nobody denies that a great deal of spectrum is going unused, but the incumbent users fear the interference that might be caused when unlicensed devices malfunction or bleed signals from adjacent channels.

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[212] In the Matter of Unlicensed Operation in the TV Broadcast Bands, etc. *Notice of Proposed Rule Making*, FCC Document 04-113.

[213] These include organizations like the New America Foundation and trade alliances like the Wireless Innovation Alliance.

[214] These include broadcaster trade organizations like Maximum Service TV (MSTV) and the Microphone Interests Coalition.

The technical debate is vast,[215] and the FCC recently conducted several rounds of real-world tests of prototype devices. Some have suggested that the Commission should protect incumbents by licensing white spaces (despite the spectrum's indeterminate nature), requiring only "fixed" (non-mobile) use, or both.

The wireless microphone issues are especially politically and technologically complicated. Only a few types of organizations are technically permitted to operate microphones in the TV bands (and only after obtaining a license), but the FCC has long looked the other way as microphone manufacturers sell systems to unlicensed and legally unlicensable entities. Among these technically illegal groups are live performance venues and houses of worship. As the Commission ponders shifting non-broadcast TV band use to more efficient technologies, it is left with the dilemma that it has been complicit in creating a large and expensive installed base of illegal users who desperately do not want to give up their systems. Indeed, Broadway and a coalition of large churches have directly lobbied the FCC on the issue, despite the fact that they are technically radio pirates.[216] On August 21, 2008, in response to a petition by public interest organization Media Access Project, the Commission issued a Notice of Proposed Rulemaking on the matter, and solicited comments.[217]

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[215] See, for example, the many technical comments in Docket No. WT 04-186. .

[216] White-space device developer Michael Marcus recently remarked, "Men of God are violating the law. . . but if someone were to walk into a church next Sunday and grab the mike out of the minister's hands and handcuff him, that wouldn't be reasonable. . . . If the Lord Eternal could look down and see everything simultaneously, what he would see from heaven is that over most of the U.S. over most of the week, the white space isn't being used" (qtd. in Mallika Rao, "Race for 'White Space' Pits Churches vs. Techies," Religous News Service [21 Aug. 2008] http://www.religionnews.com/index.php?/rnstext/race_for_white_space_pits_churches_vs_techies/).

[217] In the Matter of Revisions to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band (WT Docket No. 08-166), Public Interest Spectrum Coalition, Petition for Rulemaking Regarding Low Power Auxiliary Stations, Including Wireless Microphones, and the Digital Television Transition (WT Docket No. 08-167), *Notice of Proposed Rulemaking*, FCC 08-188 (rel. 21 Aug. 2008) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-188A1.pdf>.

On a larger scale, the technical points are moot. It is clear that technologies will indeed enable "agile" use of spectrum and that any current practical issues will be solvable in the not-too-distant future. The more fundamental question is whether or not the FCC should devote the spectrum to decentralized use or instead delegate control to a few large entities. The unlicensed approach is closer to the "commons" model, and the delegated control model is closer to the "property" model. In reality, the Commission will likely define usage rules that exert some level of control that is not purely of one model or the other. When writing these rules, I believe that the Commission should value decisions that allow an abundance of users and uses.

An unlicensed approach to white spaces would enable immediate use of the airwaves by a diversity of users. These users would not have to wait for a centralized owner to build out facilities in their area, nor would they have to pay someone for the right to use the frequencies. Such an approach would be fundamentally non-discriminatory. It would not preclude business models premised on offering access to the internet because such business would have equal access to the frequencies. However, the unlicensed approach would risk a "crisis of the commons" in which frequencies could become overused and thus benefit no one. In order for the white spaces to remain usable in the long run, equipment manufacturers would have to continue to innovate their interference avoidance mechanisms.

Fortunately, the innovation necessary for ongoing improvement of spectral efficiency would likely be catalyzed by an unlicensed approach. Unlicensed use allows for an abundance of use. This freedom would incentivize device manufacturers to find new ways of putting the frequencies to use. Not only would they be motivated to find

effective means of sharing the spectrum, such as dynamically adjusting power based on other users within range, but they would also invent devices that made unanticipated use of the frequencies. An unlicensed approach would not mandate that the spectrum be used for web access any more than it might be used for automatic reporting of gas meters.

The unlicensed approach does require minimal coordination on standards – either voluntarily or at the hand of the FCC. This is perhaps the most difficult area to get right. There has already been extensive discussion about how to adequately protect incumbent users. There has been less discussion about what rules, if any, would be needed to prevent a crisis of the commons amongst shared users. It would be a fatal error were the Commission to mandate specific, detailed rules in this area.[218] It would likely be more workable to require cooperation by some means but to leave the decisions to engineers on the ground. This approach has worked in the WiFi spectrum blocks.

From the perspective of the Spectrum Policy Task Force (SPTF) recommendations, the white spaces are a prime candidate for unlicensed use. Although it falls below the 5 GHz line, at which the SPTF suggested a default to property-like allocation, its unpredictable nature makes it difficult to propertize. Moreover, the areas in which the most white space spectrum is available – non-metropolitan areas – are also the areas least likely to be built out by traditional profit-motivated businesses. The white spaces represent an opportunity to substantially boost the meager unlicensed allocations that have taken place since the SPTF first recommended a balanced approach.

In Coase's original article, he argued, "there is no reason why users of radio frequencies should not be in the same position as other businessmen."[219] His

[218] For example, by mandating the IEEE 802.16 or 802.22 standards (fixed or mobile).
[219] Coase 30.

assumption was clear: the only relevant parties in spectrum allocation are businesses, and the competitive market should select the winners based on their ability to profit from propertized allocations. The most extreme commons approach offers the opposite conclusion: non-ownership catalyzes diverse and efficient use. Recent debates in spectrum policy have made clear that neither approach in its purest form is ideal, let alone politically viable. Part of this reality stems from public interest concerns that supersede absolutist approaches. In 700 MHz, it became clear that although property-like allocation via auction would yield enthusiastic bidding and build-out, certain non-discriminatory principles could preserve valuable use neutrality. In the white spaces, the Commission has the opportunity to unleash innovative use by a diversity of uses, but only if the rules ensure a basic level of cooperation. In each case, the compromises are motivated by core public interest considerations.

C. NATIONAL BROADBAND STRATEGY

Network non-discrimination, spectrum allocation, and a host of other issues fall under the broad category of issues related to the United States' national broadband strategy. Most commentators believe that more, faster broadband contributes to the nation's economic and social well-being.[220] The agreement ends there.

During his 2004 campaign, President Bush set an ambitious goal to achieve universal broadband by 2007.[221] Three years later, few observers thought that this

[220] See, for example, Robert D. Atkinson, "Report: The Case for a National Broadband Policy," The Information Technology and Innovation Foundation 15 June 2007 <http://www.itif.org/index.php?id=52>.

[221] Pres. George W. Bush, "Promoting Innovation and Competitiveness: President Bush's Technology

objective was even close to being achieved. The National Telecommunications Infrastructure Administration nevertheless released a report in which it stated, "a reasonable assessment of the available data indicates that the nation has, to a very great degree, realized this objective."[222] The report was roundly criticized by the Democratic FCC Commissioners[223] and public interest organizations.[224] Among those critiques were arguments that the United States is behind its international competitors by many measures and the fact that the FCC's data gathering and reporting mechanisms are seriously flawed. The political reality has been that the debate has focused on these types of questions rather than more fundamental discussions of what strategy might catalyze broadband deployment.

The first meta-debate centers around whether the United States is in fact behind other nations in broadband deployment. The argument often begins by citing Organisation for Economic Co-Operation and Development (OECD) data, in which the United States ranks fifteenth in terms of subscribers per capita among OECD countries,

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Agenda" http://www.whitehouse.gov/infocus/technology/economic_policy200404/chap4.html.

[222] United States, Depart. of Commerce, "Networked Nation."

[223] Commissioner Jonathan S. Adelstein replied, "With only half of adult Americans participating in the broadband age and U.S. consumers paying far more than citizens in other countries for less bandwidth, this report appears to be missing some key chapters. Noticeably absent is any coherent strategy going forward" ("Commissioner Jonathan S. Adelstein Responds to NTIA Report on Broadband" [31 Jan. 2008]) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-279916A1.pdf>) Commissioner Michael J. Copps stated, "Networked Nation? If the United States were a networked nation consumers would be paying half as much for broadband connections 20 times as fast. That's what many consumers around the globe get. Instead, NTIA slices and dices bad data (full disclosure: much of it from the FCC) in ever more outlandish ways to reach the conclusion that all is well - don't worry, be happy. If we spent more time developing strategies for truly ubiquitous and affordable broadband rather than watching our international competitors lap us at every turn, we actually might have something to crow about." ("FCC Commissioner Michael J. Copps Questions NTIA's Broadband Report" [31 Jan. 2008] <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-279906A1.pdf>.

[224] Free Press, "Ignoring Reality, Bush Declares Broadband Mission Accomplished" http://www.freepress.net/press/release.php?id=331; Public Knowledge, "Bush Administration Broadband Report Distorts Reality" http://www.publicknowledge.org/node/1377; Benton Foundation, Center for Creative Voices in the Media, and Florida PIRG, "More than Rhetoric Needed to Close Broadband Gap" <http://www.benton.org/node/8947>.

compared to fourth in 2001.[225] Others have tried to provide more accurate measures, which also show dismal trends.[226] The inevitable answer to these critiques is that they do not correctly measure broadband deployment and that if we employ a different method it will be clear that "we are doing fine."[227] It is clear that no single measure of broadband penetration will be authoritative. After all, different measures can inform different policy decisions. It is nevertheless becoming increasingly hard to find ways to spin the available data in order to make the case that broadband deployment in the US is robust and keeping up with ever-growing demand. Such conclusions conflict with the perceptions of end-users and even the carriers' own claims of network congestion.

Nevertheless, the international ranking debate begets an even more fine-grained number-crunching debate; whether we are appropriately gathering and characterizing our domestic deployment data. The FCC requires that broadband providers report where they are offering service, broken down by area code. If just one subscriber has service in sometimes-large area codes, the whole area is considered served. However, the Commission does not even make this level of data available, instead releasing deployment data only in limited aggregated form. This gives the Commission tremendous latitude in how it represents the data and has drawn heavy criticism from those that believe that the FCC is "creatively" propping up the numbers. Moreover, until recently the Commission defined "broadband" as anything exceeding a meager 256 kbps

[225] Organisation for Economic Co-operation and Development, "OECD Broadband Statistics to December 2006" 2007 <http://www.oecd.org/sti/ict/broadband>.

[226] Robert D. Atkinson, "Framing a National Broadband Policy," *CommLaw Conspectus* 16 (2007): 145-177.

[227] Scott Wallsten, testimony for FCC en banc hearing on broadband and the digital future, Carnegie Mellon University, 21 July 2008 <http://www.fcc.gov/broadband_digital_future/072108/wallsten.pdf.>

in the downstream direction (with no consideration at all of the upload speed so critical to two-way communication).[228]

In 2007, the Center for Public Integrity unsuccessfully sued the Commission for access to the raw data. The FCC and interveners claimed that the data was protected because its disclosure would likely cause substantial competitive harm.[229] It is difficult to understand why data disclosure that would enhance providers' ability to compete should be protected as a matter of policy, especially by an agency that has come to view greater competition as fundamental to its mission. Nevertheless, the Court deferred to the Commission's stated rules, regardless of the fundamental policy effects.

The data gathering debate is even further obfuscated by a series of efforts to suggest alternate schemes for gathering broadband data. Some of these are clearly well intentioned projects designed to provide consumers with greater information,[230] whereas others appear to have more mixed motives. In the latter category is the provider-funded *Connected Nation* initiative, premised on the idea that the government should support decentralized efforts to map from the ground-up the data that the providers already report to the FCC. Along the way, the project would help identify local stakeholders who could help grease the wheels to deployment. While it is impossible to know the hearts of the access providers, one can certainly imagine how the *Connected Nation* approach could serve as at least a distraction and at best a valuable source of marketing data.

Although questions of international ranking and data gathering are important, on a grand scheme I believe that bickering at this level has obfuscated the real issues. It is

[228] FCC 08-89 (rel. 12 June 2008), as cited earlier.

[229] *Center for Public Integrity v. FCC*, 505 F. Supp. 2d 106, 2007.

[230] See, for example, <http://broadbandcensus.com/>, which was started by Drew Clark who led the Center For Public Integrity's failed FCC disclosure suit.

clear that citizens want more and faster broadband. It is clear that broadband contributes to economic prosperity and social flourishing. A substantive national broadband strategy would focus on how to bring true broadband access to all citizens, and it would be informed by the fact that giving access providers nearly unlimited discretion in the name of "deregulation" and market forces has not worked. It would further recognize that it is not good policy to sacrifice non-discrimination principles in the process. If citizens end up with access only to a fragmented version of the internet, on which they can only access content or applications of the provider's choosing, they will not have accessed the internet at all.

This is not the first time the nation has faced the difficulty of nationwide build-out of core infrastructure. Electrification, the national highway system, and the telephone network all posed similar issues and called for varying policy interventions. What they had in common was a commitment to a unified network and a strong national vision. We need such a vision for broadband.

III. BROADBAND AND THE FUTURE OF THE PUBLIC INTEREST

We stand at a crossroads in media policy. On the one hand, we can surrender communications policy completely to competition policy. Down this path lies great uncertainty. What constitutes fair competition? How do we define the markets? What ensures welfare-enhancing access to users and uses of the network? On the other hand, we can incorporate public interest principles that have guided communications policy for decades, while being mindful of market incentives. This path does not provide us with the quantitative comfort of economic equations. However, it does not lull us into the

perception that what we value in communications is always strictly quantifiable. After all, "the public interest" has remained flexible for a reason – media change.

This is not to say that regulation in the public interest has always been well considered or effective. Broadcast regulation has been particularly troublesome, and this difficulty was significantly exacerbated by the highly scarce and one-way nature of the medium. There are more fruitful sources of public interest principles to be drawn from the legacy of wireline carriers. In this section, I describe three areas in which legacy communications policy should be transformed for the network era in light of renewed public interest considerations.

A. FROM UNIVERSAL SERVICE TO UNIVERSAL ACCESS

The internet ethos of abundance of users is paralleled in the long-held communications policy of universal service. Policymakers have long considered ways in which all citizens could be included in the national communications infrastructure. In the case of the telephone, this meant that policies were created to subsidize build-out of the network in areas that were not economically attractive. In the case of broadcast, licenses were considered based on whether or not they allowed signal coverage of and appropriate content for all communities. The fundamental idea was that the social well-being of the citizenry depended on being "served" by providers of communications. These social obligations often ran counter to the short-term economic interests of the service providers, but were nevertheless considered fundamental to the public interest. In a sense, such obligations echoed the "holding out" theory of the public interest – if a

communications business offered service to one group, it took on a public obligation to serve all.

1. Beyond Service

As our communications media shift from one-way broadcast or gatekeeper-controlled telecommunications services, our notion of universal service must also evolve. The notion that the government or an individual firm has the capacity to determine which *service* is best for the public is paternalism, hubris, or both. This is where FCC Chairman Mark Fowler was absolutely correct. There was perhaps a role for this in an environment of extreme channel scarcity and unsophisticated telecommunications technology. However, the fact that we have moved beyond that stage does not mean that there is no role for a holistic social goal of connecting everybody.

The type of connection to be valued in the increasingly two-way and layered network environment – and to be encouraged through proactive policy – is universal *access*. Such a value recognizes that there is overall social benefit to connecting all members of society, but it does not prescribe what must be done with that connection. This is true to the historical notions of universality, but less vulnerable to governmental or industry capture. It treats communications platforms as infrastructure, not as private transmission channels. It embraces both the principle that all users should be connected and the principle that once connected they should be free to communicate as they wish.

Despite the clear social and rhetorical value of "connecting all Americans," there is a clear economic argument for such an approach as well. As I detail elsewhere, the network effects of adding more nodes to the system benefit all others. No individual can capture all of these "externalities," and instead they accrue to all users. The collective

value of an interconnected network of networks far exceeds even the value of similar but unconnected islands of users. Network effects are, by their nature, difficult to quantify. Nevertheless, even a casual user of email today can recognize the benefit of being able to instantly reach nearly any other individual for a fraction of the price of the old network – the postal system. Such benefits were not possible until most Americans gained access to email. Similar effects are at work in the case of broadband, but in that case there is still great disparity.

2. Lessons from the USF

"Universal Service" is a much-reviled doctrine amongst contemporary communications policy theorists. This position is largely the result of years of governmental and industry twisting of the doctrine's implementation, as it is embodied in the Universal Service Fund (USF).[231] The USF has historically included various provisions for subsidizing the cost of telephone access for certain users. There are many lessons to be learned from the history of USF, and I cannot possibly cover them all here.[232] Two fundamental lessons, however, stand out.

First, where subsidization schemes exist they will unfailingly be warped by the particular politics of the American system. For example, Senators from rural states will win funding regardless of genuine need. Indeed, as Kearney and Merrill note, the Telecommunications Act of 1996 explicitly identified rural customers *independent* of

[231] See Rob Frieden, "Killing With Kindness: Fatal Flaws in the $ 6.5 Billion Universal Service Funding Mission and What Should Be Done to Narrow The Digital Divide," *Cardozo Arts & Entertainment Law Journa*l 24 (2006): 447-490.

[232] Nuechterlein and Weiser cover several of these shortcomings and lessons in *Digital Crossroads* 333-355.

whether or not access was "high-cost" (and the FCC has followed this guidance).[233] This is a political reality unlikely to disappear soon.

Second, incumbents will manipulate the system to avoid the costs for their next-generation systems while systematically applying them to less politically powerful entities. This reality has played out in the Voice-over-IP (VoIP) arena, in which carriers have successfully lobbied for schemes that apply universal service fees to internet-based VoIP providers while avoiding any such fees on their own broadband offerings.[234] In fact, these contributions into the fund are ironically paid out to the incumbent providers themselves. Perversely, the effect is that the FCC turned the fund that traditionally cross-subsidized *infrastructure* development into a means for extracting more funds from *application* developers. Pay-outs of USF funds have continued to be telephony-centric, meaning that the only way they support internet access is in the outmoded dial-up arena.[235]

In 2007, the FCC Federal-State Joint Board on Universal Service released recommendations that suggested various fundamental reforms to the USF, including a new "Broadband Fund."[236] On May 1, 2008, the Commission voted to implement only one of the many recommendations in the report, deferring any action on the Broadband Fund recommendation for another time.[237] This action was not encouraging for

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[233] Kearney and Merrill 1346.

[234] In the Matter of Universal Service Contribution Methodology, etc. *Report And Order And Notice Of Proposed Rulemaking,*. FCC Document 06-94 (rel. 27 June 2006).

[235] At least, it only *explicitly* and *directly* supported dial-up access. In the case of DSL, there is no way to separate subsidization of traditional phone service and subsidization of broadband service because they use the same infrastructure.

[236] *Recommended Decision*, FCC Document 07J-4 (rel. 20 Nov. 2007) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07J-4A1.pdf>.

[237] In the Matter of Universal Service Contribution Methodology, etc. *Order*, FCC Document 08-122 (rel. 1

advocates of fundamental USF reform, but time will tell whether or not the FCC finds a more sensible way of updating the rules. Creating the optimal balance is a difficult and perhaps even impossible task. Susan Crawford has argued that subsidization should instead come from the general treasury.[238] This and many other solutions may help to modernize the USF. Apart from the discussion of this particular program, however, we can incorporate the principles of universal service – and, more appropriately, *access* – into current policy decisions before the Commission and Congress.

3. A Ubiquitous and Unitary Network

Kevin Werbach steps up a level from the detailed Universal Service Fund debates in order to identify two critical principles of universal service policy.[239] These two historically valued aspects of the communications network are that it be *ubiquitous* and that it be *unitary*, i. e., affect policy decisions much more broadly than narrow USF funding questions. They resonate with the internet ethos of abundant *use* and *users*. Werbach explains that "Subsidy mechanisms to enhance ubiquity should be linked to obligations to preserve the unitary nature of the Internet. Similarly, growing government engagement in promoting universal broadband connectivity should facilitate a transition away from legacy universal service programs that no longer serve public interest goals."[240]

The goal of broadband ubiquity is consistent with contemporary notions of universal service, emphasizing the need for affordable access for all citizens. This is the

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May 2008) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-122A1.pdf>.

[238] Crawford n. 147.

[239] Werbach,"Connections."

[240] Werbach, "Connections" 2.

factor at issue when policymakers and pundits debate America's relative ranking abroad when it comes to broadband deployment. It is the principle motivating comments to the effect that as a nation we should make sure that nobody is left behind, or that we need to be concerned with a "digital divide" in broadband.[241] It is the reason we currently subsidize broadband access for schools and libraries. It is the focus of much of the rhetoric around a "national broadband strategy" that I outlined earlier. There is a reason that this value is emphasized – ubiquitous access is clearly socially beneficial. However, even though ubiquity is unanimously advocated there is remarkably little concrete action. While USF reform might make up part of the solution, the goal of ubiquitous access should inform other areas such as unlicensed spectrum access, municipal broadband, and auction rules.

The other historically valued aspect of communications networks, the notion that they should be *unitary*, goes back to the early days of the telephone. As Werbach explains, AT&T CEO Theodore Vail argued that in order to provide access to everyone, the country should have only one telephone system. Thus, someone placing a call on the network could be sure to reach any other person on the network. As some level competition replaced the AT&T monopoly toward the latter half of the twentieth century, and standards and interconnection mandates replaced the one-company approach to a unitary network. Nevertheless, the core value and its effect were preserved – communications on the network were communications on *the* network. The internet, as a network-of-networks, displays this characteristic in stark contrast to its now-defunct private-island competitors like CompuServe, Prodigy, and AOL. In terms of

[241]See, for example, . Lennard G. Kruger and Angele A. Gilroy, Congressional Research Service, Broadband Internet Access and the Digital Divide, Order Code RL30719 (Updated 4 June 2008) <http://opencrs.com/getfile.php?rid=60939>.

contemporary debates, the unitary network relies on shared standards, open interconnection, and non-discrimination. As soon as one sub-network chooses to prevent particular users or uses, the unitary network becomes fragmented.

The twin goals of a ubiquitous and unitary network can certainly be justified on economic grounds, but it is important to recognize that they also have fundamental social bases. In the context of the internet, it is all the more important for users to be able to freely communicate as they wish with their access to that network, rather than being restricted to pre-defined services. Such flexibility leads not just to economic growth (which I discuss in the next section), but also to historically rooted social benefit.

B. FROM ANTITRUST TO INNOVATION[242]

Ever since the earliest articulations of the "public interest," there has been an emphasis on fostering competition. The market-focused competition line of reasoning is one key component to communications policy. Ultimately, policymakers should be concerned with how well economic policy contributes to overall growth. In this section I consider the extent to which modern antitrust incorporates the economic realities of the broadband economy, with the substantial caveat that even if antitrust analysis were exhaustive in the economic sense it would nevertheless be incomplete in terms of broader public interest concerns.

In the United States, competition law derives primarily from antitrust statutes instituted around the turn of the century in the Sherman and Clayton Acts. While these statutes and their further development through court precedent address many situations,

[242] Some portions of this section are adapted from Whitt and Schultze.

antitrust is stretched when it comes to complex network economies like the internet. While many have observed that the "new economy" does not necessarily change the fundamental rules of economics,[243] it is another question altogether whether antitrust is up to the task. A great deal of ink has been spilled on "antitrust modernization" efforts,[244] and antitrust analysis has evolved along with industry changes. Undoubtedly, antitrust enforcers are more aware than ever of the "dynamic" nature of innovation-centric markets. Commentators are split as to whether or not simultaneous competition or temporary monopoly generates the greatest amount of innovation in a particular market.[245] More fundamentally, there is scarce awareness at the antitrust agency level of how conduct at the platform layer of a multi-sided economy can affect overall innovation in the markets that rely on that platform. Even "modernized" antitrust fails to understand the unique competitive features of such platform economies – much less the ways in which innovation is fostered or stifled in this environment.[246] Finally, any activity that

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[243] For example, economist Hal Varian has noted that, "there are some forces that are particularly important in high-tech. . . . [T]hese forces are not 'new'; indeed the forces at work in network industries in the 1990s are very similar to those that confronted the telephone and wireless industries in the 1890s" (

Hal Varian, Joseph Farrell, et al., *The Economics of Information Technology: An Introduction* (Cambridge, MA: Cambridge UP, 2004) 3.

[244] Antitrust Modernization Commission, *Report and Recommendations* (2007) <http://www.amc.gov/report_recommendation/amc_final_report.pdf>.

[245] Jonathan B. Baker, "Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation," American Antitrust Institute Working Paper no. 07-04 (Feb. 2008) <http://ssrn.com/abstract=1103623>.

[246] My critique here is two-fold: 1) modern antitrust agencies do not understand multi-sided markets even in terms of traditional "competition" considerations, and 2) modern antitrust agencies do not understand how the more dynamic innovation operates in a platform market. There is some recent literature on the former;see, e.g., Dale S. Evans, "The Antitrust Economics of Multi-sided Platform *Mar*k*ets*," *Yale Journal on Regulation* 20.2 (Summer 2003): 325-381. However, even these nascent and highly contested analyses do not address the second part of my critique. In short, some scholars have begun to understand how competition in multi-sided markets functions, and antitrust agencies have begun to incorporate innovation theory in traditional one-sided market analysis, but few have tried to put them together. Philip J. Weiser is an exception, performing such analysis primarily in the roughly parallel domain of intellectual property ("The Internet, Innovation, and Intellectual Property Policy," *Columbia Law Review* 103.3 [Apr. 2003]: 534-613). Some recent antitrust cases, such as *Microsoft*, begin to touch upon these considerations. There

does not fall within the Sherman Act's narrow view of firm-to-firm conduct – such as non-profit or peer-to-peer innovation – is outside the purview of antitrust altogether. Antitrust is a focused tool, or at best a toolbox, for specific, tactical interventions. Economics-based public interest justifications must look beyond antitrust's ever-narrowing Sherman Act §2 "monopolization" arguments to incorporate richer platform innovation analysis.

1. The Invisible Gland

Adam Smith's foundational 1776 work, *The Wealth of Nations*, theorized that as a firm developed specialized roles for workers, their skills would benefit the productivity of the firm and thus the market overall. The cost of goods they produced would be disciplined by the "invisible hand" of competitive pricing, and the market would converge on an optimally efficient equilibrium.[247] In the early twentieth century, economist Joseph Schumpeter modified this competitive hypothesis, pointing out that firms often formed temporary monopolies and were subsequently unseated by other firms through an act he called "creative destruction." The critical advantage of these winning new entrants was their improved technology. Through this process, innovation occurred in a stair-step fashion rather than a continuous line.[248]

Much of economic growth theory has focused on how best to encourage development of these technologies. Nobel Prize winning economist Robert Solow

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is, however, no mention of such platform or multi-sided market considerations anywhere in the Antitrust Modernization Commission report. In any event, there is little consensus among scholars, and let alone antitrust enforcers, as to how to consider such factors.

[247] Adam Smith, *The Wealth of Nations* (1776). Interestingly, Smith's famous "invisible hand" can be reinterpreted as an emergent behavior of the capitalist system.

[248] Joseph Schumpeter, *Capitalism, Socialism, and Democracy*, (3rd ed. (New York: Harper,1950).

recently observed that Schumpeter

> worked out his conception of the entrepreneur, the maker of "new combinations," as the driving force and characteristic figure of the fits-and-starts evolution of the capitalist economy. He was explicit that, while technological innovation was in the long run the most important function of the entrepreneur, organizational innovation in governance, finance, and management was comparable in significance. . . . I think that this is Schumpeter's main legacy to economics: the role of technological and organizational innovation in driving and shaping the growth trajectory of capitalist economies.[249]

Solow's own work on growth theory in the 1950's was highly influential, but ultimately failed to fully explain the stair-step pattern of technological progress that Shumpeter described. In Solow's growth model, technology fed into the system at a steady rate. When it came to explaining what generated this innovation, however, the Solow model was at a loss, because it treated this technological advance as something that happened *exogenously,* coming from outside the economy itself. To be sure, technology had assumed a place of importance, but the core question of how to encourage technology and the resulting growth remained unanswered.

2. Endogenous Growth

Schumpeter's core claims about how technological change happens would lay

[249] Robert Solow, "Heavy Thinker," review of *Prophet of Innovation: Joseph Schumpeter and Creative Destruction, The New Republic*, 21 May 21 2007: 48-50.

somewhat dormant until the 1980s. By the end of the decade, the younger generation of economists was hard at work on the "increasing returns" problem. In short, they asked, "Why do some economies appear to grow very rapidly, despite the fact that all of the traditional inputs are simply increasing at a steady rate?"

Exogenous factors are background conditions and givens that lie outside an economic model. In traditional economic theory, factors of production are land, labor, and capital. Knowledge and human nature were simply "givens," a fixed part of the background. Young economist Paul M. Romer concluded instead that technological change and the growth of knowledge (the results of ideas) should be viewed as endogenous to the system – produced by it and affected by changes in the economy itself. Furhtermore, he noted ideas can be copied and adapted in ways that people or things cannot. In economic terms, ideas are "non-rival."[250] To Romer, ideas are what truly matter in generating economic growth.

Romer accepted fellow economist Kenneth Arrow's observation that "information is not only the product of inventive activity, it is also an input,"[251] creating a positive feedback effect of technological progress.[252] At the same time, he noted Schumpeter's point that firms can be spurred to innovate in order to gain or retain their market power. But he also altered these basic ideas in critical ways. Arrow's feedback loop of technological knowledge became not simply learning-by-doing within firms, but rather a

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[250] Paul Romer, "Endogenous Technological Change," *The Journal of Political Economy* 98.5 Part 2 (October 1990): S71-S102. Romer was not the first to observe this non-rivalrous property of ideas, but by applying it in this context he helped unlock the mystery of knowledge-fueled growth.

[251] Kenneth J. Arrow, "Economic Welfare and the Allocation of Resources for Invention," in *The Rate and Direction of Inventive Activity,* ed. Richard R. Nelson (Princeton, NJ, Princeton UP, 1962) 618.

[252] Romer.

global multiplier of productivity when this non-rival information resource was shared. Ideas, Romer explained, cannot be over-used. Schumpeter's "creative destruction" would happen, according to Romer, in situations where monopoly was neither complete nor highly difficult to overcome.[253]

3. Anti-Antitrust

So, what does this all mean for the role of antitrust when it comes to broadband? Antitrust faces myriad limitations in accurately describing the internet economy. Merger reviews rely on market-share analysis that is a poor proxy for multi-sided market power. The antitrust adjudication process assumes that parties have the resources and know-how to bring complaints. Competition analysis falls apart when one tries to assess would-be or non-profit competitors. Monopoly power is less relevant when one considers similarly motivated oligopolists. Vertical leveraging matters little if the discriminating firm is not trying to enter the adjacent market. Network effects introduce indirect incentives that are hard to account for.[254] It is an odd notion that we entrust oversight of one of the most

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[253] Thus, monopolies are not categorically beneficial to innovation, as some extreme Schumpeterians claim. As Carl Shapiro has noted, "The harder questions arise when we seek to assess the durability of monopoly power in dynamic industries. The obvious starting point is to ask how long the firm has enjoyed a dominant position using some measure of market share. While a firm that has long captured a dominant share of the market *might* lose share rapidly, some good reason needs to be provided why this is likely to be the case. [. . .] As a rule of thumb, a reasonable working hypothesis is that a firm with a very large market share that has persisted for several years or more in a market with relatively stable contours has durable monopoly power" ("Antitrust, Innovation, and Intellectual Property," testimony to Antitrust Modernization Commission, 8 Nov. 2005, 4) <http://govinfo.library.unt.edu/amc/commission_hearings/pdf/Statement_Shapiro.pdf>.

[254] Philip J. Weiser notes, "Given the importance of building and maintaining a large mass of users on a given network, firms will face conflicting incentives as to how to manage product compatibility and interoperability between networks. On one hand, inter-firm cooperation will spur a more valuable network; on the other hand a firm stands to gain huge economic rents (i.e., profits) by maintaining proprietary control over a network. To do so, however, a firm will either need to maintain intellectual property protection over key technologies, ensure that the relevant contracts preclude compatibility, or to strategically prevent others from undermining its network standard. The challenge for antitrust courts is to determine the nature of a firm's conduct in cases where it may well defy easy or quick categorization" ("The Relationship of Antitrust and Regulation," 6). Indeed, I think that this "challenge for antitrust

significant industries, which also serves as a core channel of democratic discourse, to a doctrine ill-suited for these complex considerations.

The strongest argument in favor of an antitrust-like approach comes from Phil Weiser.[255] He claims that regulators should consider only competitive or consumer protection harms, and that it should only do so in *ex post* adjudication (not before-the-fact rulemakings). These two aspects of his approach are distinct, although it is at times difficult to distinguish between them in his arguments. It is also difficult to envision which enforcement agency or statute specifically he expects will carry the weight. He appears to envision a "more perfect" version of both the FCC and the Federal Trade Commission. He seems to hold that the FTC should only have a role with respect to consumer protection (Section 5 of the Sherman Act), and that the FCC should undertake competition oversight.

The FTC-based consumer protection that Weiser envisions would involve more disclosure by providers regarding their traffic blocking or discrimination, and agency oversight to make sure that they are doing what they promise. There seems to be little reason to dispute the notion that this would lead to more informed consumers that would better be able to make wiser market decisions. However, in addition to these disclosure requirements, Weiser proposes that the agency mandate a minimal, non-discriminatory, best-efforts level of broadband access. The FTC has established its authority under §5 to mandate disclosure and transparency, but something akin to a best-efforts service

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courts" can easily become a brick wall. There is no reason to believe that such courts will substantially improve their ability to adjudicate cases, especially in the context of the many exacerbating factors I have outlined.

[255] Philip J. Weiser, "The Next Frontier for Network Neutrality," *Administrative Law Review* 60.2 (2008), pending.

mandate appears to be entirely unprecedented. Indeed, in his short description of this proposal, he provides no basis for such authority. Furthermore, he essentially delegates the industry-specific task of determining what constitutes adequate characteristics of minimal "broadband" to the general purpose FTC. The most likely outcome appears to be that the FTC simple does not attempt to adopt such a standard either because it does not have the authority or because it does not have the domain expertise. Weiser seems to anticipate this outcome, noting that, If the FTC chooses not to insist on a level of continuing best efforts delivery, it should pay close attention to a broadband provider's disclosures. . . ."[256]

Weiser's competition policy amounts to asking the FCC to perform case-by-case adjudication of providers' conduct, according to general competition considerations. He proposes that any discriminatory practice should be assumed to be anticompetitive by default, but that providers should be allowed to show otherwise. He appears to believe that the FCC should take some heed from FTC or DOJ precedent, but it is unclear what principles in particular should guide FCC competition considerations. He notes that there is little consensus amongst scholars and policy makers with respect to the competitive effects of conduct by platform gatekeepers. It seems that the facts in *ex post* adjudication would likely be subject to intense debate. Furthermore, the agency weighing the merits would be operating without the statutory or doctrinal support of formal antitrust.

Weiser has essentially swapped the traditional roles of general antitrust agencies and the industry-specific FCC. His "best-efforts" internet access is a weakened version of traditional non-discriminatory safeguards, re-framed as an exclusively economic

[256] Weiser, *Next Frontier* 26.

argument. The disclosure obligations that he places in the hands of the FTC are already being implemented in part by the FCC in the Comcast dispute. His FCC-run competition policy relies on antitrust-like principles – both in its competitive considerations and its *ex post* nature – but places responsibility in the hands of an institution with less knowledge and a less clear mandate. The net effect may simply be overall reticence to act.

Network economies such as broadband are complex adaptive systems that defy traditional antitrust definitions.[257] *Verizon v. Trinko* arguably removed telecommunications from the purview of antitrust, but for the wrong reason. It is not clear that regulatory agencies are any better at assessing narrowly conceived anticompetitive conduct than the antitrust agencies – indeed they are probably worse. However, regulatory agencies *do* tend to take a more holistic view of markets and social considerations than the antitrust agencies. This may make for better or worse policy depending on the competence of the agency. For antitrust to remain relevant in broadband policy – whether it is enforced via the antitrust agencies or regulatory agencies – it must consider the multi-sided, dynamic, platform-oriented nature of the broadband market. This calls for network-aware policymaking.[258] It may well be that regulatory agencies that consider the broad nature of the market are better situated to assess and control the deleterious economic effects of gatekeeper conduct than are the specific antitrust agencies.

[257] I explore this in detail in Whitt and Schultze.

[258] See, e.g., Economides.

C. FROM CONTROLLED USE TO GENERAL PURPOSE[259]

The internet is different. It is different from earlier media because it is fundamentally a many-to-many platform with low barriers to entry and global reach. It is also potentially more flexible than its predecessors, encompassing and extending their features. However, although this flexible nature lends to its exceptional characteristics, it also makes it similar to earlier technologies. Many of these earlier innovations have similarly been open to diverse uses and follow-on innovations. Economists call them "General Purpose Technologies" and internet scholar Jonathan Zittrain refers to this feature as "generativity." Like motors or electricity, the internet spurs economy-wide growth. Like the printing press or the signal processing, the internet facilitates society-wide communication. To realize the full potential of the internet, we need communications policy that catalyzes diverse use and guards against attempts to lock it down. Whether we are successful will ultimately determine whether the network serves as public interest infrastructure or just another special purpose channel.

1. General Purpose Technologies

A General Purpose Technology (GPT) is a special type of technology that has broad-ranging enabling effects across many sectors of the economy. The foundational work on GPTs was first published by Timothy Bresnahan and Manuel Trajtenberg in 1992.[260] In line with Arrow and Romer, they describe how this particular type of technology is most likely to generate increasing returns and that this growth comes from

[259] Some portions of this section are adapted from Whitt and Schultze.

[260] Timothy Bresnahan and Manuel Trajtenberg, "General Purpose Technologies 'Engines of Growth'?" (1992), reprinted in *Journal of Econometrics* 65 (1995): 83.

specific applications that depend on ideas in the "general" layer of technology. Specifically, GPTs play a role of "enabling technologies" by opening up new opportunities rather than offering complete, final solutions.[261] The result is "innovational complementarities,"; "the productivity of R&D in a downstream sector increases as a consequence of innovation in the GPT technology. These complementarities magnify the effects of innovation in the GPT, and help propagate them throughout the economy."[262]

Since 1992, economists have expanded upon how electricity, motors, personal computers, and software platforms all exhibit this characteristic.[263] The Internet in particular is a GPT, with "the potential to contribute disproportionately to economic growth" because it generates value "as inputs into a wide variety of productive activities engaged in by users."[264] Whereas Romer focused generally on the economy overall, the GPT literature makes clear that some technologies are especially important when it comes to non-rival reuse and follow-on innovation.

One lesson for policymakers is that when considering the appropriate balance between static incentives and dynamic openness, one must also consider the extent to which a particular type of technology is a GPT. Looking back at the development of the IT industry more than ten years after his key GPT paper, Bresnahan commented,

> The most economically important use of a general purpose technology need not be determined by the inventors of the GPT, but rather by the inventors of complements, applications. But let us be clear that the lesson here for

[261] Bresnahan and Trajtenberg 84.

[262] Bresnahan and Trajtenberg 84.

[263] See, e.g., Elhanan Helpman, *General Purpose Technologies And Economic Growth* (Cambridge, MA: MIT Press, 1998).

[264] Frischmann and van Schewick 424, 398.

> Schumpeterian Economics is far more general than the narrow and specific point about "open architecture," which seems like a technical concept from computing. Instead, the point is about the role of a permissive, forward-looking system of innovation in which inventions can come from multiple sources.[265]

Keeping a GPT "general" is not always in the clear interest of firms that might seek to control them. A firm might envision greater profits through making the tremendously useful resource more scarce, or by charging much higher than marginal cost. The same firm might also think that the GPT could be far more efficient if it were customized solely for a particular application.[266] While these perceptions might be true in the short term, or for a particular firm's profits, it can have devastating effects for growth of the economy overall. The more general purpose the technology, the greater are the growth-dampening effects if it becomes locked down in the interest of a particular economic agent.

2. Generativity

Jonathan L. Zittrain calls the internet a "generative technology," meaning that it has great "capacity for leverage across a range of tasks, adaptability to a range of different tasks, ease of mastery, and accessibility."[267] The important feature of generative

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[265] Timothy Bresnahan, "Creative Destruction in the PC Industry," in *Perspectives on Innovation*, ed. Franco Malerba and Stefano Brusoni (New York: Cambridge UP, 2007) 105-140: 118.

[266] This is not to say that firms cannot create specialized implementations of GPTs. On the contrary, much of the value of GPTs comes from specific instantiations. Nobody would think of bringing a desktop computer along on a plane in order to work en route, but most laptop computers are not fundamentally different with respect to their general-purpose nature than desktops. If, however, a firm obtained and exercised control over the fundamental PC, operating system, or network platforms, it would foreclose welfare-enhancing specialization.

[267] Zittrain, "The Generative Internet."

systems such as the Internet is that users can easily do numerous things with them, many of which may not have been envisioned by the designers. If, for example, the Internet had been built solely as a platform for sending email and required retooling to do anything else, most applications and business models never would have developed. Zittrain notes that these uses span not only the economically beneficial, but also many social and collaborative applications like Wikipedia.[268] That being said, on Wikipedia and elsewhere on the internet, scammers, spammers, and no-goodniks often take advantage of this freedom and spoil it for the rest of us.

The critical question, from the generative perspective, is how to allow for productive behavior while discouraging counter-productive behavior. This is a very different question than whether or not such use is worth preserving at all. It allows us to consider whether preserving productive generativity requires us to mandate that owners of the network infrastructure permit future inventions even when those inventions may be a new virus or movie-pirating application. It could seem intuitive that if a particular type of web site is prone to malware attacks, or if a particular protocol is primarily used for piracy, we should simply block it altogether. It would seem logical that we should extend gatekeepers' ability to peer into the traffic that is passing over their networks in order to block the bad stuff. It might even make sense for us to mandate that for new broadband spectrum, operators should only allow what they can positively identify as family friendly.[269] Totalitarian regimes might seek to cleanse the network of all criticism.

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[268] See, e.g., Jonathan L. Zittrain, *The Future of the Internet and How to Stop It* (New Haven, CN: Yale UP, 2008) 151.

[269] Indeed, this is precisely what the FCC recently proposed for an upcoming auction. See In the Matter of Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band, *Further Notice of Proposed Rulemaking*,FCC Document 08-158, WT Docket No. 07-195 (rel. 20 June 2008).

Zittrain's proposal is that rather than slowly allowing the network to become more centrally controlled and narrowly defined, we should use generativity to fight generativity – in order to preserve generativity.

This might sound non-intuitive, if not logically invalid, but it is entirely consistent with the exceptional development of the internet. Absent a specific mandated use or centralized control, the internet ethos begat means of self-governance – albeit on top of a regulated non-discriminatory transport architecture.[270] Generativity reminds us that there are in-between spaces and solutions, and that one important criteria for considering these solutions is not just whether they will solve today's problems, but whether they will leave open the possibility of unexpected innovation in the future.

3. Emergence

In the presence of network effects, General Purpose Technologies, and generativity, policymakers need to appreciate that they cannot engineer the public interest uses of broadband. They should also understand that the companies that are in the business of broadband cannot predict who or what will be the most beneficial to society. This is not to say that there is no role whatsoever for government – far from it. Instead, the government can provide critical safeguards with the goal of supporting the unanticipated.

The internet has formed from the bottom up. Simple protocols and rules of interconnection allowed diverse devices and networks to join together organically. The modular structure of the protocols allowed decentralized innovation at each layer. Use

[270] See my earlier description of the combined effect of the *Computer Inquiries*, *Carterphone*, and common carriage.

neutrality allowed anyone to create new applications or express themselves freely. Researchers in both biology and economics have begun to examine this type of productive non-coordinated behavior under the general framework of "emergence."

Emergent systems are often described as being "organism-like" in the sense that they are constantly growing and adapting. Each agent follows localized rules and motivations, but the end result is additive and interdependent. When agents interact through networks, they evolve their ways of doing work and discover new techniques. Out of this combined activity, a spontaneous structure emerges. Without any centralized control, emergent properties take shape based on agent relationships and the conditions in the overall environment.[271] These characteristics appear in many human systems. James Odell notes that "with the stock market, thousands of agents act independently to buy and sell shares of particular stocks and bonds. Yet from this independent behavior, an organism-like product called the stock market emerges."[272] Much of the development of cities similarly derives from the bottom up.

An emergence-aware set of public interest principles would recognize that limitations on users or uses of the network today – whether from government agencies or market actors – forecloses possibilities in the future. To be sure, some of these benefits can be described in terms of traditional economics or "modernized" antitrust, but many cannot. Remarkably, the earliest norm-based and common-law requirements on transportation infrastructure providers respected the emergence of that which it could not

[271] Eric D. Beinhocker. The Origin Of Wealth: Evolution, Complexity, and the Radical Remaking of Economics (Boston, MA: Harvard Business School Press, 2006).

[272] James J. Odell, "Agents and Complex Systems," Journal of Object Technology 1.2 (July-Aug. 2002): 35-45 <http://www.jot.fm/issues/issue_2002_07/column3>.

predict. In the network society, the internet has become a parallel platform for emergent innovation and expression.

CONCLUSION

The business of transporting communication is more than an economic enterprise. The norms of English ports and the internet ethos share at least this assumption in common. The business of broadband is a kind of public calling that brings with it public obligations. It is a potential bottleneck for commerce and innovation that must remain open in the interest of social welfare. It is public infrastructure and a type of common good. These realities obligate access providers to deliver communications for all users and for all uses, without imposing their own discriminatory preferences. It obligates the government to find ways to catalyze build-out and connection – and to police providers when their private interests are at cross-purposes with the ever-elusive public interest.

Our social definition of new technologies will influence how we regulate them. Cable's early development, and the "Blue Sky" rhetoric, offers a case study. As Rowland explains, unstated assumptions about the nature of a medium often guide formal policy.[273] In Parson's words, social definitions "structurate" the policy decisions that follow.[274] Pool explained how the one-way nature of early cable technology predisposed it away from being subjected to non-discriminatory rules despite the eventual evolution

[273] These assumptions remained "largely inviolate" even amidst the revolutionary language of the cable era. William D. Rowland Jr. "The Process of Reification: Recent Trends in Communications Legislation and Policy-Making." *Journal of Communication* 32.4 (Autumn 1982): 114-136, 116.

[274] Parsons 2.

toward broadband that he foresaw.[275] Streeter explains how public discourse and civil society helped to support the myth of unbridled technology propelling us into limitless multichannel abundance and a two-way global network.[276]

These scholars represent the intersection of media studies and communications policy in the cable era. As the United States faces a similarly significant technology and policy shift in the context of the internet, there is a need for similar disciplinary cross-pollination. The way that we socially define the internet will inform the policy that emerges. It need not be classified as a Title I, II, III, or VI service for us to articulate fundamental principles. This does not mean that blindly believing in such principles will make them so. In the case of cable, the promised instant two-way communication did not appear until pressure from dial-up internet forced cable operators to innovate. The internet and its ethos of openness has arguably moved us closer to "Blue Sky" ideals. Is it foolish to think that we should appeal to the public interest in crafting broadband policy?

I think not. It is clear that many historical implementations of the public interest are mismatched with today's internet. Broadband is not broadcast. Broadcast is one-way transmission whereas broadband is a truly two-way network. Broadband is also not common carriage. The common carriage regime is premised on circuit-switched technology and static use patterns. Broadband could continue to develop as a platform for participatory communication that feeds democratic discourse, entrepreneurship, and unanticipated new use. However, this path is far from secured. There is great temptation for gatekeepers to close off these possibilities in the interest of short-term profit, and for

[275] Pool 166-176.

[276] Streeter, *The Cable Fable* 177.

the government to misunderstand its role and commit regulatory sins of commission or omission. Policymakers face the challenge of understanding the public interest values of former media without blindly applying outmoded frameworks to new situations. They must also resist the fear that any intervention is inherently inferior to market forces.

A holistic approach to media policy for the network society embraces public interest obligations in the context of broadband as a business. Non-discrimination preserves the voice of diverse speakers, encourages innovation, and facilitates free markets. Universal access amplifies these benefits via network effects. Contemporary debates over issues like network neutrality, spectrum allocation, and a national broadband strategy are the fora in which we socially define the internet. Policy decisions that recognize broadband as infrastructure will best reconcile our historical values of "the public interest" with our evolving principles for the internet.

Works Cited

Abelson, Hal, Ken Ledeen, and Harry Lewis. *Blown to Bits: Your Life, Liberty, and Happiness after the Digital Explosion*. Upper Saddle River, NJ: Addison-Wesley, 2008.

Adams, John L., Lawrence G. Roberts, and Avril Ijsselmuiden. "Changing the Internet to Support Real-time Content Supply from a Large Fraction of Broadband Residential Users." *BT Technology Journal* 23.2 (Apr. 2005): 217-231.

Adelstein, Jonathan S. "Commissioner Jonathan S. Adelstein Responds to NTIA Report on Broadband" (31 Jan. 2008) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-279916A1.pdf>).

Administration White Paper on Communications Act Reforms, 25 Jan. 1994 <http://www.ibiblio.org/pub/academic/political-science/internet-related/NII-white-paper>

"Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities." *Report and Order and Notice of Proposed Rulemaking* 20 FCC. Rcd. 14, 853. 2005.

"Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks." Declaratory Ruling, 22 FCC. Rcd. 5901. 2007.

Arrow, Kenneth J. "Economic Welfare and the Allocation of Resources for Invention." In *The Rate and Direction of Inventive Activity*. Ed. Richard R. Nelson. Princeton, NJ: Princeton UP, 1962. 609-626.

"At SBC, It's All About 'Scale and Scope.'" *Business Week* 7 Nov. 2005 <http://www.businessweek.com/@@n34h*IUQu7KtOwgA/magazine/content/05_45/b3958092.htm>.

Atkinson, Robert D. "Framing a National Broadband Policy." *CommLaw Conspectus* 16 (2007): 145-177.

---. "Report: The Case for a National Broadband Policy." The Information Technology and Innovation Foundation 15 June 2007 <http://www.itif.org/index.php?id=52>.

Baker, Jonathan B. "Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation." American Antitrust Institute Working Paper no. 07-04 (Feb. 2008) <http://ssrn.com/abstract=1103623>.

Barlow, John Perry. < http://homes.eff.org/~barlow/Declaration-Final.html>.

Beinhocker, Eric D. *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics.* Boston, MA: Harvard Business School Press, 2006.

Benkler, Yochai. "Overcoming Agoraphobia: Building the Commons of the Digitally Networked Environment." *Harvard Journal of Law and Technology* 11.2 (1998): 287–400.

---. "Some Economics of Wireless Communications." *Harvard Journal of Law and Technology* 16.1 (2002): 25–83.

---. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven, CN: Yale UP, 2006.

Benton Foundation, Center for Creative Voices in the Media, and Florida PIRG. "More than Rhetoric Needed to Close Broadband Gap" <http://www.benton.org/node/8947>.

Berman, Jerry, and Daniel J. Weitzner. "Abundance and User Control: Renewing the Democratic Heart of the First Amendment in the Age of Interactive Media." *The Yale Law Journal* 104.7 (May 1995): 1619-1637.

Berresford, J. W. "The Scarcity Rationale for Regulating Traditional Broadcasting: An Idea Whose Time Has Passed." FCC Media Bureau Staff Research Papers (2005).

Bogen, David S. "The Innkeeper's Tale: The Legal Development of a Public Calling." *Utah Law Review* 51 (1996): 51-92.

Bohn, Roger, Hans-Werner Braun, Kimberly C. Claffy, and Stephen Wolff. "Mitigating the Coming Internet Crunch: Multiple Service Levels Via Precedence." Tech rep., UCSD, San Diego Supercomputer Center, and NSF (1993).

Bresnehan, Timothy. "Creative Destruction in the PC Industry." In *Perspectives on Innovation*. Ed. Franco Malerba and Stefano Brusoni. New York: Cambridge UP, 2007.

Bresnahan, Timothy, and Manuel Trajtenberg. "General Purpose Technologies 'Engines of Growth'?" 1992. Reprinted in *Journal of Econometrics* 65.1 (Jan. 1995): 83-108.

"Broadcasting & Cable." 9 Aug. 2008 <http://www.broadcastingcable.com/index.asp?layout=talkbackCommentsFull&talk_back_header_id=6372794&articleid=CA6372794>.

Burdick, Charles K. "The Origin of the Peculiar Duties of Public Service Companies, Part I." *Columbia Law Review* 11.6 (June 1911): 514-531.

---. "The Origin of the Peculiar Duties of Public Service Companies, Part II." *Columbia Law Review* 11.7 (Nov. 1911): 616-638.

Bush, Pres. George W. "Promoting Innovation and Competitiveness: President Bush's Technology Agenda" <http://www.whitehouse.gov/infocus/technology/economic_policy200404/chap4.html>.

Bush, Vannevar. "As We May Think." *The Atlantic Monthly* July 1945: 101-108.

Cannon, Robert. "The Legacy of the Federal Communications Commission's Computer Inquiries." *Federal Communications Law Journal* 55 (2003): 167-206.

Carnegie Commission on Educational Television. *Public Television, a Program for Action: The Report and Recommendations of the Carnegie Commission on Educational Television.* New York: Bantam, 1967.

Cerf, Vint. "The Internet is for Everyone." Internet RFC 3271 <http://www.apps.ietf.org/rfc/rfc3271.txt>.

Cherry, Barbara A. "Back to the Future: How Transportation Deregulatory Policies Foreshadow Evolution of Communications Policies." *The Information Society* 24.5 (2008), pending.

---. "Utilizing 'Essentiality of Access' Analyses to Mitigate Risky, Costly and Untimely Government Interventions in Converging Telecommunications Technologies and Markets." *CommLaw Conspectus* 11.2 (2003): 251-275.

Childs, Ozro William, IV. "The FCC's Proposed CATV Regulations." *Stanford Law Review* 21.6 (June 1969): 1685-1713.

Coase, Ronald H. "The Federal Communications Commission." *Journal of Law and Economics* 2 (Oct. 1959): 1-40.

Copps, Michael J. "FCC Commissioner Michael J. Copps Questions NTIA's Broadband Report" 31 Jan. 2008 <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-279906A1.pdf>.

Crawford, Susan P. "The Internet and the Project of Communications Law," 11 Feb. 2007 <http://ssrn.com/abstract=962594>.

Darby, Larry F., Jeffrey A. Eisenach, and Joseph S. Kraemer. "The CLEC Experiment: Anatomy of a Meltdown." *Progress on Point*. 23 September 2002. <http://www.pff.org/issues-pubs/pops/pop9.23clecexperiment.pdf>.

DACA Regulatory Framework Working Group. < http://www.pff.org/issues-pubs/communications/other/031707dacastmt.pdf>.

Douglas, Susan J. *Inventing American Broadcasting, 1899-1922*. Baltimore: Johns Hopkins UP, 1987.

Economides, Nicholas. "Public Policy in Network Industries." NYU Law and Economics Research Paper no. 06-49 (Sept. 2006) <http://ssrn.com/abstract=936469>.

Engelman, Ralph. "Origins of Public Access Cable Television 1966-1972." *Journalism Monographs* 23 (Oct. 1990.): 1 ff.

Evans, David S. "The Antitrust Economics of Multi-sided Platform Markets." *Yale Journal on Regulation* 20.2 (Summer 2003): 325-381.

Evans, David S., Andrei Hagiu, and Richard Schmalensee. *Invisible Engines.* Cambridge, MA: MIT Press, 2006.

Farrell, Joseph, and Philip J. Weiser. "Modularity, Vertical Integration, and Open Access Policies: Towards a Convergence of Antitrust and Regulation in the Internet Age." *Harvard Journal of Law and Technology* 17.1 (Fall 2003): 85-134.

Faulhaber Gerald R., and David J. Farber. "Spectrum Management: Property Rights, Markets, and the Commons." AEI-Brookings Working Paper 02-12 (Dec 2002) <http://rider.wharton.upenn.edu/~faulhabe/SPECTRUM_MANAGEMENTv51.pdf>.

FCC Cable TV Fact Sheet. June 2000 <http://www.fcc.gov/mb/facts/csgen.html>.

"FCC Classifies Broadband Over Power Line-Enabled Internet Access as 'Information Service.'" Press release 3 Nov. 2006 <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-268331A1.pdf>.

Fowler, Mark S. "The Public's Interest." *Communications & Law* 4 (1982): 51-55. Transcript of address to International Radio and Television Society, Waldorf Astoria, New York, 23 September 1981.

---. Interview, *Reason* 1 November 1981: 48-51 <http://findarticles.com/p/articles/mi_m1568/is_1998_Dec/ai_53260535/pg_4>.

Fowler Mark S., and David S. Brenner. "A Marketplace Approach to Broadcast Regulation." *Texas Law Review* 60 (1982): 207-257.

Free Press. "Ignoring Reality, Bush Declares Broadband Mission Accomplished" <http://www.freepress.net/press/release.php?id=331>.

Free Press. <http://www.savetheinternet.com/blog/2006/04/19/act-now-to-save-the-internet/>.

Frieden, Rob. "Killing With Kindness: Fatal Flaws in the $ 6.5 Billion Universal Service Funding Mission and What Should Be Done to Narrow the Digital Divide." *Cardozo Arts & Entertainment Law Journa*l 24 (2006): 447-490.

Frischmann, Brett M., and Mark A. Lemley. "Spillovers." Stanford Law School Working Paper April 2006; *Columbia Law Review* 107.1 (Jan. 2007) 257 ff.

Frischmann, Brett M., and Barbara van Schewick. "Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo." *Jurimetrics* 47: 409-420, pending.

Goodell, Geoffrey, Allan Friedman, and Scott Bradner. "Scarcity, Discrimination, and Transparency: Understanding Network Management." Paper to TPRC 2008 Conference, 27 Sept. 2008, pending.

Great Lakes Broadcasting Co. 37 F.2d 993 D.C. Cir. 1930.

Grieve, Willie A., and Stanford L. Levin. "Common Carriers, Public Utilities and Competition." In *Industrial and Corporate Change* 5.4. New York: Oxford UP, 1996. 993-1011.

Hale, Sir Matthew. *De Portibus Maris*. Reprinted in *A Collection of Tracts Relative to the Law of England* 78. Ed. Francis Hargrave. London, 1787.

Hamilton, Walton H. "Affectation with Public Interest." *Yale Law Journal* 39.8 (June 1930): 1089-1112.

Hansell, Saul. "Verizon and AT&T Win Big in Auction of Spectrum." *New York Times* 21 March 2008 <http://www.nytimes.com/2008/03/21/technology/21auction.html>.

Hazlett, Thomas. "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." *Harvard Journal of Law and Technology* 14.2 (Spring 2001): 335-567 <http://jolt.law.harvard.edu/articles/pdf/v14/14HarvJLTech335.pdf>.

Helpman, Elhanan. *General Purpose Technologies and Economic Growth.* Cambridge, MA: MIT Press, 1998.

Hemphill, C. Scott. "Network Neutrality and the False Promise of Zero-Regulation." Columbia Law and Economics Working Paper no. 331. 14 Apr. 2008.

Hollins, Timothy, and Broadcasting Research Unit. *Beyond Broadcasting: Into the Cable Age*. London: BFI, 1984.

Holmes, Oliver Wendell. *The Common Law*. Boston: Little Brown, 1881.

"Industry Leaders Announce Open Platform for Mobile Devices." Press release 5 Nov. 2007 <http://www.openhandsetalliance.com/press_110507.html>.

"Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities." Declaratory Ruling and Notice of Proposed Rulemaking" 17 F.C.C.R. 4798. 2002.

Interstate Commerce Act of 1887. 24 Stat. 379. Approved 4 Feb. 1887.

Isenberg, David. "The Dawn of the Stupid Network." *ACM Networker* 2.1 (Feb./Mar. 1998): 24-31.

Jenkins, Henry. *Convergence Culture: Where Old and New Media Collide*. New York: New York UP, 2006.

Jones, William. "The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective," appendix to the Reply Comments of International Business Machines Corporation in Competitive Carriers Rulemaking CC Docket No. 79-252. Filed 4 Apr. 1980.

Kearney, Joseph D., and Thomas W. Merrill. "The Great Transformation of Regulated Industries Law." *Columbia Law Review* 98.6 (Oct. 1998): 1323-1409.

Krasnow, Erwin. "The 'Public Interest' Standard: The Elusive Search for the Holy Grail." *Federal Communications Law Journal* 50.3 (1998): 606-636.

Krotoszynski, Ronald J., Jr. "The Inevitable Wasteland: Why the Public Trustee Model of Broadcast Television Regulation Must Fail." *Michigan Law Review* 95.6 (May 1997): 2101-2138.

Kwerel, Evan R., and John R. Williams. "A Proposal for Rapid Transition to Market Allocation of Spectrum." U.S. Federal Communications Commission. Office of Plans and Policy Working Paper no. 38 (2002).

Lane v. Cotton. 88, Eng. Rep.1458. K.B. 1701.

Lemley, Mark A., and Lawrence Lessig. "The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era." *UCLA Law Review* 48 (2001): 925-972.

Lessig, Lawrence. *Code*. New York: Basic Books, 2006.

---. *The Future of Ideas: The Fate of the Commons in a Connected World*. New York: Random House, 2001.

Licklider, J. C. R. "Televistas: Looking Ahead Through Side Windows." In Carnegie Commission. 201-225.

Licklider, J. C. R., and Council on Library Resources, et al. *Libraries of the Future*. Cambridge, MA: MIT Press, 1965.

Licklider, J. C. R., and Robert W. Taylor. "The Computer as Communication Device." *Science and Technology* 76 (April 1968): 21-31.

MacKie-Mason, Jeffrey K., and Hal Varian. "Economic FAQs about the Internet." *The Journal of Economic Perspective* 8.3 (Summer 1994): 75-96 <http://hdl.handle.net/2027/spo.3336451.0001.110

Mansell, Robin. "New Media Competition and Access: The Scarcity-Abundance Dialectic." *New Media Society* 1.2 (1999): 155-182.

McAllister, Breck P. "Lord Hale and Business Affected with a Public Interest." *Harvard Law Review* 43.5 (Mar. 1930): 759-791.

Minow, Newton N. "Television and the Public Interest." National Association of Broadcasters. 9 May1961.

Minow, Newton N., and Craig L. LaMay. *Abandoned in the Wasteland: Children, Television, and the First Amendment.* New York: Hill and Wang 1995.

Mitra, Steve. "The Death of Media Regulation in the Age of the Internet." *New York University of Legislation and Public Policy* 4.2 (2001): 415-438.

Munn v. Illinois. 94 U.S. 113. 1876.

Nachbar, Thomas. "The Public Network." March 2008 Working Draft *CommLaw Conspectus* (Dec. 2008), pending <http://ssrn.com/abstract=1009641>.

National Cable & Telecommunications Association v. Brand X Internet Services. 545 U.S. 967. 2005.

Nebbia v. New York. 291 U.S. 502. 1934.

Noam, Eli M. "Beyond Liberalization II: The Impending Doom of Common Carriage." *Telecommunications Policy* 18 (1994): 435-452.

"Nokia to Acquire Symbian Limited to Enable Evolution of the Leading Open Mobile Platform." Press release 24 June 2008 <http://www.nokia.com/A4136001?newsid=1230415>.

Nuechterlein, Jonathan E. "Antitrust Oversight of an Antitrust Dispute: An Institutional Perspective on the Net Neutrality Debate." AEI Center for Regulatory and Market Studies Working Paper 08-07 (Feb. 2008).

Nuechterlein, Jonathan E., and Philip J. Weiser. *Digital Crossroads: American Telecommunications Policy in the Internet Age*. Cambridge, MA: MIT Press, 2005.

---. "First Principles for an Effective Rewrite of the Telecommunications Act of 1996." AEI-Brookings Joint Center for Regulatory Studies Working Paper 05-03 (Mar. 2005) <http://ssrn.com/abstract=707124>.

Odell, James J. "Agents and Complex Systems." *Journal of Object Technology* 1.2 (July-Aug. 2002): 35-45 <http://www.jot.fm/issues/issue_2002_07/column3>.

Organisation for Economic Co-operation and Development. "OECD Broadband Statistics to December 2006." 2007 <http://www.oecd.org/sti/ict/broadband>.

Owen, Bruce. M. *The Internet Challenge to Television.* Cambridge, MA: Harvard UP, 1999.

Owen, Bruce M. "The Net Neutrality Debate: Twenty Five Years after United States v. AT&T and 120 Years after the Act to Regulate Commerce." John M. Olin Program in Law and Economics, Stanford Law School, Working Paper no. 336

(Feb. 2007) <http://ssrn.com/abstract=963623?. Repub. with minor changes and no footnotes as "Antecedents to Network Neutrality." *Regulation* 30.3. The Cato Institute (Fall 2007).

Parsons, Patrick R. "Defining Cable Television: Structuration and Public Policy." *Journal of Communication* 39.2 (1989): 10-26.

"Partial Merger of Roads Favored; Interstate Commerce Commission Opposes Return to Anti-Pooling Conditions." *The New York Times* 6 Dec.1918: 14.

Pool, Ithiel de Sola. *Technologies of Freedom.* Cambridge, MA: Belknap-Harvard UP, 1983.

Poor, Jeff. "FCC Commissioner: Return of Fairness Doctrine Could Control Web Content." Business & Media Institute 12 Aug. 2008 <http://www.businessandmedia.org/articles/2008/20080812160747.aspx>.

Postel, Jon. "Transmission Control Protocol." Internet Request for Comments RFC 793, ISI. Sept. 1981.

Powell, Michael K. "Broadband Migration III: New Directions in Wireless Policy." Silicon Flatirons Telecommunications Program, University of Colorado, Boulder. 30 Oct. 2002 <http://www.fcc.gov/Speeches/Powell/2002/spmkp212.html>.

---. "The Public Interest Standard: A New Regulator's Search for Enlightenment." American Bar Association 17th Annual Legal Forum on Communications Law, Las Vegas, Nevada. 5 April 1998.

Public Broadcast Act of 1967. <http://www.cpb.org/aboutpb/act/remarks.html>.

Public Knowledge. "Bush Administration Broadband Report Distorts Reality" <http://www.publicknowledge.org/node/1377>.

Rao, Mallika. "Race for 'White Space' Pits Churches vs. Techies." Religous News Service (21 Aug. 2008) <http://www.religionnews.com/index.php?/rnstext/race_for_white_space_pits_churches_vs_techies/>.

Red Lion Broadcasting Co. v. Federal Communications Commission. 395 U.S. 367. 1969.

Reed, David. FCC En Banc Public Hearing on Broadband Network Management Practice at Harvard Law School, Cambridge, MA (25 Feb. 2008). <http://www.fcc.gov/broadband_network_management/022508/reed.pdf>.

Reno v. ACLU. 521 U.S. 844. 1997.

Romer, Paul M. "Endogenous Technological Change." *Journal of Political Economy* 98.5 (Oct. 1990): S71-S102.

Rosch, J. Thomas. "Broadband Access Policy: The Role of Antitrust." Broadband Policy Summit IV: Navigating the Digital Revolution, Washington, DC. 13 June 2008.

Rostow, Eugene V. *President's Task Force on Communications Policy: Final Report*. Washington: GPO, 1968.

Rowland, William D., Jr. "The Meaning of 'The Public Interest' in Communications Policy, Part I: Its Origins in State and Federal Regulation." *Communication Law & Policy* 2.3 (1997): 309-328.

---. "The Meaning of 'The Public Interest' in Communications Policy Part II: Its Implementation in Early Broadcast Law and Regulation." *Communication Law & Policy* 2.4 (1997): 363-397.

---. "The Process of Reification: Recent Trends in Communications Legislation and Policy-Making." *Journal of Communication* 32.4 (Autumn 1982): 114-136.

Schewick, Barbara van. "Towards an Economic Framework for Network Neutrality Regulation." *Journal on Telecommunications and High Technology Law* 5 (Spring 2007): 329-391.

Schumpeter, Joseph. *Capitalism, Socialism, and Democracy.* 3rd ed. New York: Harper, 1950.

Shapiro, Carl. "Antitrust, Innovation, and Intellectual Property." Testimony to Antitrust Modernization Commission. 8 Nov. 2005 <http://govinfo.library.unt.edu/amc/commission_hearings/pdf/Statement_Shapiro.pdf>.

Singer, Joseph W. "No Right to Exclude: Public Accommodations and Private Property." *Northwestern University Law Review* 90 (1996): 1283-1497.

Skitol, Robert A. "Three Years after *Verizon v. Trinko*: Broad Dissatisfaction with the Whole Thrust of Refusal to Deal Law." *The Antitrust Source* 6.4 *(*April 2007).

Smith, Adam. The Wealth of Nations. 1776.

Solow, Robert. "Heavy Thinker." Review of *Prophet of Innovation: Joseph Schumpeter and Creative Destruction. The New Republic* 21 May 21 2007. 48-50.

Spectrum Policy Task Force. ET Docket No. 02-135 *Report.* (Rel. Nov. 2002) <http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf>.

Speta, James. "FCC Authority to Regulate the Internet: Creating It and Limiting It." *Loyola University Chicago Law Journal* 35 (2004): 15-39. <http://ssrn.com/abstract=490122>.

Starr, Paul. *The Creation of the Media: Political Origins of Modern Communications*. New York: Basic Books, 2004.

Streeter, Thomas. "Beyond Freedom of Speech and the Public Interest: The Relevance of Critical Legal Studies to Communications Policy." *Journal of Communication* 40.2 (June 1990): 43-63.

---. "The Cable Fable Revisited: Discourse, Policy, and the Making of Cable Television." *Critical Studies in Mass Communication* 4 (1987): 174-200.

Telecommunications Act of 1996, Title IV. Section 401. Codified as 47 USC 159 (10)(b).

Adam Thierer, "A Fairness Doctrine for the Internet," City Journal 18.3 (18 Oct. 2007) <http://www.city-journal.org/html/eon2007-10-18at.html>.

---. *Media Myths: Making Sense of the Debate over Media Ownership*. Washington, DC: The Progress & Freedom Foundation, 2005.

The Transportation Act of 1920. Approved 28 Feb. 1920 <http://laws.lp.findlaw.com/getcase/us/258/204.html>.

Turner, S. Derek. "Broadband Reality Check II: The Truth Behind America's Digital Decline" (2006) <http://www.freepress.net/docs/bbrc2-final.pdf>.

United States. Depart. of Commerce. "Networked Nation: Broadband in America 2007 National Telecommunications and Information Administration." Washington: GPO, 2008 <http://www.ntia.doc.gov/reports/2008/NetworkedNationBroadbandinAmerica2007.pdf>.

United States. GAO. "Telecommunications: Broadband Deployment Is Extensive Throughout the United States, But It Is Difficult to Assess the Extent of Deployment Gaps in Rural Areas" [2006] <http://www.gao.gov/new.items/d06426.pdf>.

United States v. Terminal Railroad Association. 224 U.S. 383 (1912) and 236 U.S. 194 (1915).

Varian, Hal, Joseph Farrell, et al. *The Economics of Information Technology: An Introduction.* Cambridge, MA: Cambridge UP, 2004.

Verizon v. Trinko. 540 U.S. 398. 2004.

Waldrop, Mitchell. M. *The Dream Machine: J. C. R. Licklider and the Revolution That Made Computing Personal*. New York: Viking, 2001.

Walker, Jessie. *Rebels on the Air: An Alternative History of Radio in America*. New York: New York UP, 2001.

Waller, Spencer Weber, and Brett M. Frischmann. "Revitalizing Essential Facilities." *Antitrust Law Journal* 75.1 (2008) <http://ssrn.com/abstract=961609>.

Wallsten, Scott. Testimony for FCC en banc hearing on broadband and the digital future, Carnegie Mellon University. 21 July 2008 <http://www.fcc.gov/broadband_digital_future/072108/wallsten.pdf.>.

Weinberg, Jonathan. "Broadcasting and Speech." *California Law Review* 81 (1993): 1103-1206.

Weiser, Philip J. "The Internet, Innovation, and Intellectual Property Policy." *Columbia Law Review* 103.3 (Apr. 2003): 534-613.

---. "The Next Frontier for Network Neutrality." *Administrative Law Review* 60.2 (2008), pending.

---. "The Relationship of Antitrust and Regulation in a Deregulatory Era." University of Colorado Law Legal Studies Research Paper no. 06-19. *Antitrust Bulletin* 50 (Sept. 2005).

Weiser, Philip J., and Robert Atkinson. "A 'Third Way' on Network Neutrality" 30 May 2006 < http://www.itif.org/index.php?id=63>.

Werbach, Kevin D. "The Centripetal Network: How the Internet Holds Itself Together, and the Forces Tearing it Apart." *UC Davis Law Review* (2008), pending <http://ssrn.com/abstract=1118435>).

---. "Connections: Beyond Universal Service in the Digital Age." *Journal on Telecommunications and High Technology Law* (2008), pending.

---. "Supercommons: Toward a Unified Theory of Wireless Communication." *Texas Law Review* 82.4 (2004): 863–973.

Whitt, Richard, and Stephen J. Schultze. "Emergence Economics." *Journal on Telecommunications and High Technology Law* 7.2, pending.

Wired Magazine, 5.03 (March 1997) <http://www.wired.com/wired/archive/5.03/ff_push.html>.

Wu, Tim. "Wireless Carterfone." *International Journal of Communication* 1 (2007): 389 <http://ssrn.com/abstract=962027>.

---. "Network Neutrality, Broadband Discrimination." *Journal on Telecommunications and High Technology Law* 2 (2003): 141-179.

---. "Why Have a Telecommunications Law?: Anti-Discrimination Norms in Communications." *Journal on Telecommunications and High Technology Law* 5.1 (2006): 15-46.

Wyman, Bruce. "The Law of Public Callings as a Solution of the Trust Problem." *Harvard Law Review* 17.3 (1904): 156-173.

---. "The Rise of the Interstate Commerce Commission." *Yale Law Journal* 24.7 (May 1915): 529-543.

Yoo, Christopher S. "Beyond Neutrality." *Harvard Journal of Law and Technology* 19.1 (Fall 2005): 2-77 <http://ssrn.com/abstract=742404>.

---. "Neutrality and the Economics of Congestion." *Georgetown Law Journal* 94 (June 2006) <http://ssrn.com/abstract=825669>.

---. "What Can Antitrust Contribute to the Network Neutrality Debate?" U. of Penn., Institute for Law & Economics Research Paper no. 07-11 <http://ssrn.com/abstract=992837>.

Zittrain, Jonathan L. *The Future of the Internet and How to Stop It.* New Haven, CN: Yale UP, 2008.

---. "The Generative Internet." *Harvard Law Review* 119 (May 2006): 1974-2040 <http://www.harvardlawreview.org/issues/119/may06/zittrain.pdf>.