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Communications Policy for 2006 and Beyond

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Communications Policy for 2006 and Beyond

Reed E. Hundt*

Gregory L. Rosston**

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I. INTRODUCTION

The key goal of communications policy is to promote the welfare of our citizens, primarily through productivity gains. These productivity gains will increase business productivity and increase the benefits to consumers through access to better products and services and through lower prices. Much of the gains will come from decreases in prices of transmission and increases in the amount of information that can be cheaply and rapidly moved from place to place. These efficiency goals can be combined with other social and political goals such as universal access and make achievement of such goals much less costly.

The best means to achieve these goals of communications policy is to maximize the operations of markets. We prefer markets, as opposed to state-owned or state-managed communications businesses, because markets collect and distribute information about what sellers are willing to offer and buyers are willing to purchase in many ways better than the state. However, markets in communications industries may not produce optimal results for at least two principal reasons that may also apply to other industries. First, competition-winning firms tend to obtain market power and may have incentives and ability to deter new entry. In addition, winning firms have different incentives than new entrants that may affect the introduction of new products and services. Second, regulators seeking to distribute communications services to everyone in the nation, for very laudable social and economic reasons, have tended to interfere in ways that diminish the responsiveness of the market as well as the magnitude and speed of the introduction of new goods and services.

The United States currently has a communications policy in place that does not state clearly its own goals, yet applies regulations that greatly affect outcomes. Not surprisingly, the result appears to be deficient in both economic and social benefits. A better communications policy would substitute markets for regulation as a way to determine both what is sold and what price is paid while continuing to be conscious of specific market-power concerns and obtaining any desired social benefits in the most efficient manner possible. Such a wise policy must assure that new entrants, armed with a different sense of what can be sold and who might be persuaded to buy, should be able to challenge even the largest

incumbents. An attribute of this policy would be that all could enjoy the social and economic benefits of ubiquitous and all-inclusive access to the network (i.e., allowing everyone the chance to communicate with everyone else all the time) without detracting materially from the price-setting and competitive mechanisms of markets or imposing an unnecessary cost burden on the overall economy.

One of the metrics for judging communications policy is whether the creation of new networks, goods, services, and markets is keeping pace with rapid technological advances. An important example of success in this respect is the proliferation of wireless communications. Apparently, the absence of retail price regulations, presence of cheap interconnection mandated by government, and existence of multiple providers have all led to high growth, high usage, high penetration, and high rate of technological change for wireless services.¹ This is especially true since the additional competition from the introduction of Personal Communications Services (“PCS”) services and the development of Nextel’s service around the same time increased the number of competitors in each geographic area from two to five or more.² Communications policy should aspire to replicate this success story for wireline and communications services.

By contrast, broadband in the United States may be viewed by some as a frustrating disappointment both from the perspective of service providers and users of broadband networks. For reasons that trouble, and to a degree mystify many, in Japan and Korea, among other countries, broadband providers offer customers much higher bandwidth (i.e., speed) at much lower prices than in the United States and achieve much greater penetration rates.³ This is true even in densely populated areas of the United States that have similar demographic characteristics as large cities in the other countries.

Follow-on effects from higher broadband penetration include the development of new products and services. Social benefits to areas such as

1. See CTIA, *CTIA SEMI-ANNUAL WIRELESS SURVEY (2005)*, <http://files.cita.org/pdf/CTIAMidYear2005Survey.pdf>.

2. See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Tenth Report*, 20 F.C.C.R. (forthcoming 2006), para. 2 (2005), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-173A1.pdf (stating that 97% of the American population lives in an area with 3 or more wireless operators and that the market is behaving competitively).

3. See Thomas Bleha, *Down to the Wire*, Foreign Aff., May/June 2005, at 111, 112 (stating that Japan has much faster broadband at cheap rates and that South Korea has the world’s highest percentage of individuals who use broadband.). It is unclear at this point in time whether the rapid provision of high-speed access in these other countries is financially remunerative for the firms deploying the services.

education and health care may also become quite significant. Meanwhile, in the United States, broadband penetration rates are growing substantially, but nevertheless are still at levels below those in Japan and Korea.⁴ Moreover, it is not certain that broadband providers will soon offer the much higher speed services of 8 to 40 megabits per second per household that are evidently being offered in Seoul, Tokyo, and other Asian cities.⁵ A wise communications policy would assess the state of American broadband provisions, define goals, and lay out sensible means to achieve the desired outcomes.

Communications in the modern world often involve sending information across national boundaries, yet networks by definition always have a local, physical manifestation and local, social, and economic impact. It should follow that sensible policy creates both new jobs and productive work because employees can use innovative techniques to build, maintain, and utilize networks. So, another test of the wisdom of policy should be whether productive new jobs are created as a result of that policy. At the same time, it must be admitted that less productive, old jobs may be replaced and the sheer number of jobs in the business of providing service may decline as new technologies permit any employee to do more work than was possible in previous years.

As set forth in more detail below, communications policy should extend the operation of market forces more fully to wireline and broadband communications markets. It would assure that new firms with new technologies can easily enter and provide service. And, it would obtain universal participation in communications markets by techniques that do not undercut either of these two goals. To these ends, Congress and the Federal Communications Commission ("FCC") in 2006, as well as every state regulatory commission, must change many existing laws and regulations. Although the prescriptions herein are legitimately subject to debate, they are not fundamentally ideological in their content. Therefore, it is reasonable to ask that the Bush administration and Congress agree to create a bipartisan and independent commission to suggest a complete overhaul of the law and policy for communications, and to do so as soon as possible. This Article is aimed at starting the sort of discussion such a commission would pursue. While, as the architect Mies van der Rohe

4. *Id.*

5. See *id.* at 114; see also Reed E. Hundt, *Reforming Telecom Policy for the Big Broadband Era: Why Is Government Subsidizing the Old Networks When "Big Broadband" Convergence is Inevitable and Optimal*, 14 *New Am. Found. Spectrum Series 2* (2003), http://www.newamerica.net/Download_Docs/pdfs/Pub_File_1431_1.pdf (arguing that as much as 10–100 megabits per second should become available for household use and 1–10 gigabit per second should be available for business use).

famously said, “God is in the details,”⁶ it is also true that blocking out the main issues is not an unworthy first step and certainly is as much as this Article hopes to achieve.

II. ACCESS NETWORK COMPETITION

The fundamental problem of all communications policy is the access network, also called the last mile or local loop. In the context of the household, the access network is the economically powerful but visually humble line that typically stretches from the house along the driveway to the telephone pole, where it is tied to other telephone lines and carried down the street until it hits a box in a building called a central office. In some cases, the access network is wireless so the traffic is collected from wireless signals and relayed to a central office either through wires or through additional wireless connections.

More than half of households have two primary wireline access lines—the wire-based telephone company and a cable television company.⁷ In some areas, there is only a single network. In the future, power lines may be a cost-effective way to provide alternative wire-based access, but today scarcely any homes have such a service.⁸

At the central office, traffic is combined and signals are directed where the sender wishes. Calls originate from an access network and terminate on an access network, which may have a different proprietor⁹ or different architecture¹⁰ than the originating network. Any time a network is accessed calls are both originated and terminated (e.g., e-mails are both sent and received, Web sites are accessed or information is downloaded from a Web site). Calls are directed through a specialized computer called a switch; a router directs communications that occur via the Internet. A more complicated and hence more precisely accurate description can be provided, but this suffices as a means to describe the economic issue: a firm incurs a fairly large cost to build an access network and a minimal cost for each use of it. To put the same point in numerical terms, a telephone company, or for that matter a cable company installing a modern access

6. Wikipedia, Ludwig Mies van der Rohe, http://en.wikipedia.org/wiki/Ludwig_Mies_van_der_Rohe (last visited Nov. 20, 2005).

7. Kevin Martin, Chairman, FCC, Bucks for Broadband Summit 11 (Jan. 12, 2005), www.fcc.gov/commissioners/martin/documents/summit011205.ppt (showing a 53% overlap in high speed cable and DSL availability as of 2003).

8. See Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems Carrier Current Systems, *Report and Order*, 19 F.C.C.R. 21,265, paras. 4–9 (2004), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-245A1.pdf.

9. For example, a Verizon customer may call a Bell South customer.

10. For example, a wireline customer may call a cell phone.

network capable of serving video in addition to communication services, has to spend between \$1000 and \$3000 to string the lines from switch to house, or in the case of cable, head-end to house for a typical suburban area with buried plant.¹¹

Every call on a wireline network requires little if any extra capital expenditure and minimal incremental cost. For wireless networks, the capacity of the access network correlates more directly to the volume of traffic so that upfront fixed costs are proportionately smaller than in wire networks.¹² However, even for wireless networks, the upfront costs are still quite large.

In a long-run competitive equilibrium, prices tend to marginalize cost. In an industry with large sunk costs and small marginal costs, like most of the telecommunications industry, pricing that goes to marginal cost will not provide an adequate return to the investors who provide capital. Investors will be cautious about investing money upfront because *ex post* competition could drive prices to nonremunerative levels. For example, the long-distance industry has large fixed upfront costs and extremely low incremental costs. Long-distance firms deployed large amounts of capacity in the late 1990s that greatly exceeded total demand, even for a number of subsequent years.¹³ As a result, competition drove prices down substantially.¹⁴ Collectively, the long-haul industry has likely produced negative return on invested capital. In the long run, perhaps only two or three national long-haul carriers will be able to stay in business.

With access network, very similar scenarios are plausible that investors may be reluctant to support new entrants. However, product differentiation is one way for new entrants to attract capital for network build-out. For example, a mobile service or a lower cost or higher quality network may be better able to acquire funding than a duplicate fixed wire network.

Economists studying access networks for many decades tended to believe that wire-based access networks may be a natural monopoly, meaning that production by a single firm results in the lowest cost

11. Nicholas J. Frigo, AT&T Labs, Presentation to Federal Communications Commission: Whatever Happened to Fiber to the Home? 16-17 (April 17, 2003), http://ftp.fcc.gov/oet/tac/TAC_III_04_17_03/fiber_to_the_home.ppt.

12. GEORGE CALHOUN, DIGITAL CELLULAR RADIO 83-91 (1988).

13. David Kaserman & John May, *Competition in the Long-distance Markets*, in 1 Handbook of Telecommunications Economics 509, 521 (Martin E. Cave et al. eds., 2002).

14. See INDUS. ANALYSIS & TECH. DIV., FCC, STATISTICS OF THE LONG DISTANCE TELECOMMUNICATIONS INDUSTRY 13 (2003), available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/Ildrpt103.pdf (scroll down past the Public Notice).

provision per unit.¹⁵ Belief that any access network is a natural monopoly led many years ago to decide to regulate such networks for two principal purposes: first, to set a price that assured the builder that the fixed cost—often called historic or embedded cost—would be recovered and second, to set a price below the maximum that the consumer would be willing to pay given the lack of choice among offerings.¹⁶

The historic view of a natural monopoly, however, may not be valid, or at least may not be valid when the existing allegedly “naturally monopolistic” network can be replaced by a network that has a radically different total cost or generates a materially different set of services. As evidence of this, cellular networks provide both lower cost per added subscriber and different functionality from fixed-line networks since mobility is different than stationary calling. For example, cable networks provide multichannel video as well as, in some cases, voice, while satellite networks provide more channels than cable. So, each of these examples provides access to full or partial substitution of the allegedly naturally monopolistic fixed line telephone access network. As a result of the last quarter-century of competition policy in America, the so-called monopoly in the telephone network has given way to a market that includes, just for voice, five wireless providers, sometimes a cable company offering communications services, and the traditional telephone company. Of course, cost, services, and quality vary across these networks such that the case for or against natural monopoly is not closed. Yet, the phenomenon of different networks converging to provide alternative forms of similar services appears to be quite real.

This multifirm market leads to the real possibility that as long as government does not allow too many mergers in the access market to take place, then retail price regulation is no longer necessary. The prospect of retail price deregulation is reasonably bright for voice, video, and data services since each of these three genres of communications markets is marked by multifirm competition in many geographic areas. The virtue of deregulating prices is that each consumer can then signal the price it is willing to pay and can purchase different services, not merely traditional local phone service, but perhaps mobile or high-speed Internet, and providers have the incentives to invest in the services that consumers desire. This should result in productivity gains and high paid jobs as well as benefits to consumers. It should also produce best utilization of capital over

15. See STEPHEN G. BREYER, *REGULATION AND ITS REFORM* 1, 15–19 (1982) (stating and countering this proposition).

16. See generally KIP W. VISCUSI ET AL., *ECONOMICS OF REGULATION AND ANTITRUST* 377–411 (2d ed. 1995) (discussing natural monopolies).

time, although in high-fixed cost industries the risk of wasted capital is always significant.

However, the maximum benefits of deregulation will result if both actual and potential competition exist in the provision of the deregulated services. Therefore, a necessary part of deregulation is the continued application of antitrust principles.

The first step for communications policy, then, is to achieve retail price deregulation where multifirm competition is available. To this end, Congress and the FCC need to order states to deregulate retail prices where at least three firms offer similar services. A crucial question will be whether wireless and wireline are considered to provide similar services. But that is an antitrust issue and is routinely answered by economic studies relating to substitution.

Any move to deregulate dominant firms should be cushioned by annual caps of price increases at a number that, if somewhat arbitrary, did not produce meaningful declines in subscription. For example, regulators could limit retail price increases to a maximum of 5% increase per year for traditional local telephone service offered by any regulated firm that wished to take advantage of price deregulation. In addition, a quantity-based rule might make sense for firms with a large market share. This would help to take account of quality changes for different services. For example, if a firm offered a higher quality service, it would be allowed to charge a higher price. A possible rule would be that if any firm has more than 60% market share for any particular kind of communication service, it would not be allowed to raise prices to a level that causes more than 5% per annum reduction in subscriptions in the market as a whole. These somewhat rough, but perhaps useful protections of consumers, of course, can be debated by the proposed independent commission. This approach is very likely to be vastly superior to the detailed rate regulation currently in place.

Wireless firms would have no such restrictions as long as the market remains as competitive as it is today. The FCC deregulated all retail pricing regulation in the early 1990s.¹⁷ The wireless marketplace has multiple competitors and the market is performing well, at least from any economist's perspective, although investors may find the competition unappealing compared to other markets. Cable and satellite competition,¹⁸

17. Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services, *Second Report and Order*, 9 F.C.C.R. 1411, paras. 12, 14-16 (1994) (hereinafter *CMRS Second Report and Order*).

18. See generally Telecommunications Act of 1996, 47 U.S.C. § 543 (2000) (giving an express preference for competition in cable).

coupled with possible video entry by telephone companies, and other forms of access to video, such as broadcast, streaming media, and rental, all suggest that video price regulation is not necessary; it scarcely exists now.¹⁹ Therefore, the proposal here relates principally to the means for deregulating the wire-based phone company. High speed data services are generally provided by two firms: cable and telephone companies. Currently, those two providers are not regulated; with a third provider, the proposed rule would give more assurance of deregulation. Nevertheless, this proposal should provide very large incentives to invest efficiently while at the same time protecting consumers. But will it produce a natural monopoly in time? That is not easily predicted, and should be guarded against by the additional rules proposed below.

Under any circumstances, one outcome of a more market-oriented policy is likely to be network architecture that is not uniform across the country and has prices that vary significantly from place to place. This is a good outcome—it encourages competition for the purchase of equipment and other network inputs and provides competition and comparisons between different types of architecture. It leads to efficient scale and scope since these economies differ across geographic areas. Different modes of access networks also reflect varying costs of providing network services to different areas of the country and reflect varying demand for network services. In some areas, for example, stringing fiber to every home and business would not be prohibitively expensive, whereas in other areas, the cost would be significantly higher.²⁰ The framework outlined above should be flexible enough to allow prices in different areas to move toward cost.

The policy recommended here should permit new firms to enter. These firms may be backed by private investment or even municipal investment. Contrary to the Supreme Court decision in *Nixon v. Missouri Municipal League*²¹ that gave states the ability to bar cities and towns from providing telecommunications services to their residents, Congress should pass a law declaring that communities should have the ability to use their funds in a way that they see fit. The government should make it clear that if citizens decide to operate their own co-op or municipally owned franchise to provide broadband services on a wireless, wireline, or hybrid basis, they can legally do so. It is astounding to think that government instead may bar

19. See 47 U.S.C. § 543 (c)(3)–(4) (ending the regulation of cable programming rates for § 543 (c) after Mar. 31, 1999).

20. The Federal Communications Commission's Hybrid Cost Proxy Model presents estimates of the costs of construing a network to various different locations. FCC, Hybrid Cost Proxy Model, <http://www.fcc.gov/wcb/tapd/hcpm/welcome.html> (follow "hcpm_install.zip" hyperlink and the instructions on Web site) (last visited Nov. 20, 2005).

21. *Nixon v. Missouri Municipal League*, 541 U.S. 125 (2004).

citizens from coming together to buy common communications capability. This possibility is economically unwise as well as inequitable. Conversely, no municipality should be able to use law or public property to compete unfairly against a private firm. For example, municipalities should not be allowed preferential access to public facilities.

The goal of access network competition should be to produce long-term consumer benefits by providing competition and incentives for firms to invest and innovate. Access networks that arise under these criteria will be highly productive. In competition, over time the most efficient network is likely to prevail. In short, in any particular geographic market a winning network may emerge and others may fall into desuetude. To this end, government must not tip the scales for or against a particular competitor.

One way that such tipping occurs is the imposition of selective taxes on different providers. At this time, governments impose substantially different taxes depending on whether the phone uses wireline, wireless, or VoIP service.²² Tax policy should not be used to differentially advantage competing service providers. Congress should pass a law to this effect. Differential tax policy can have a variety of effects—businesses and higher income individuals may have better access to alternatives such as VoIP that have lower taxes than conventional telephone service. Thus, lower income households may wind up paying higher taxes. State and local governments have levied fairly high taxes on mobile phone service²³ that may make wireless less of a competitive threat to wireline service.

Another way to distort the access market is to impose unnecessary or unreasonably high charges for necessary inputs, such as spectrum or access to telephone poles or rights of way. Public property should be available at the same price for all providers, and preferably the price should verge toward cost (including opportunity cost²⁴), so as to permit firms to dedicate their funds to maximizing the carrying capacity of the network as opposed

22. See Ellen Muraskin, *Bill Would Let States Tax VoIP*, *EWEEK*, July 22, 2004, <http://www.eweek.com/article2/0,1895,1748841,00.asp> (last visited Nov. 20, 2005); see also Mark Rockwell, *Carriers Find States Taxing*, *WIRELESS WEEK*, Feb. 1, 2005, <http://www.wirelessweek.com/article/CA499943.html?spacedesc=Departments> (last visited Nov. 20, 2005).

23. Rockwell, *supra* note 22.

24. "Opportunity cost" is the value of the resource in its next best alternative use. Spectrum serves as a great example. The actual use of spectrum does not cost anything. Yet, spectrum is highly valuable and has fetched high prices in government auctions. By selling spectrum at an auction, the winning bidder should pay the value of the second highest bidder. This means that the purchaser of spectrum pays the opportunity cost of the spectrum, which is the appropriate cost to society of its use in any particular service. Wikipedia, Opportunity cost, http://en.wikipedia.org/wiki/Opportunity_cost (last visited Nov. 20, 2005).

to paying for wireless licenses or some other input. As set forth in more detail below, Congress should work to minimize the cost of all public property inputs needed by access networks, including spectrum rights.

A. *Spectrum Policy to Develop Access Networks*

Because the economic characteristics of spectrum-based networks differ from wire-based networks, and the different services spectrum-based networks can provide, spectrum is likely to facilitate the creation of important alternative access networks. The best way to get new spectrum-based networks is for the FCC to make large amounts of spectrum available to potential access network providers.

The FCC needs to adopt a clear and systematic approach for spectrum currently available and to set forth a clear and immutable policy for the treatment of spectrum that will come to the market in the future. Unfortunately, the FCC has a poor track record, and that poor record is not just historical. In November 2002, the FCC's Spectrum Policy Task Force issued a report that said the FCC should generally rely on market forces, and gave an outline for how to increase the amount of spectrum in the market and how to use market forces to govern the use of spectrum and to increase flexibility.²⁵ That report did not go far enough in its ambitions for spectrum management.²⁶ But by and large it could be the basis for a good law. It certainly is superior to the actual decisions of the FCC in the last few years.²⁷

By law, the FCC should be required to publish a blueprint for making spectrum available to the public and obliged to follow the blueprint. The proposed independent commission should describe such a blueprint. This blueprint should recognize that the entire spectrum is interrelated, and therefore, should auction all spectrum in a short period of time. Some spectrum is likely to be used currently for any number of purposes. If

25. SPECTRUM POLICY TASK FORCE, FCC, REPORT 38 (2002), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf.

26. See generally *Statement of Reed E. Hundt Before the United States Senate Committee on Commerce, Science and Transportation*, 108th Cong. (2004), <http://commerce.senate.gov/pdf/hundt042804.pdf> (laying out a basic plan to increase competition in the telecommunications market).

27. See generally Thomas W. Hazlett, *Spectrum Tragedies*, 22 YALE J. ON REG 242 (2005) (arguing that spectrum regulations have empirically failed to account for tragedy of the commons); Gregory L. Rosston, *The Long and Winding Road: The FCC Paves the Path with Good Intentions*, 27 TELECOMM. POL'Y, 501 (2003) (highlighting the Commission's difficulty in moving to a market based approach); Gregory L. Rosston, *A Losing Battle for All Sides: The Sad State of Spectrum Management*, 56 FED. COMM. L.J., 437, 440 (2004) (reviewing JENNIFER A. MANNER, *SPECTRUM WARS: THE POLICY AND TECHNOLOGY DEBATE* (2003)) (observing that FCC compromise of a spectrum dispute ended in a wasteful, inefficient use of the spectrum).

auctioned, the buyers should have the right to pay the current users to stop using the spectrum. The FCC will need to describe a mediation process to facilitate such clearing. However, the more spectrum sold, the more liquid that market will be; efficiency will then be served.

The ultimate goal would be to have spectrum not be a scarce resource and to have the price be zero. That requires ensuring that a sufficient supply of spectrum is made available with maximum flexibility, that firms enjoy returns from using spectrum efficiently to innovate and introduce new technologies, and to make spectrum available to others who can use it more efficiently. In other words, the FCC would try to eliminate scarcity or monopoly rents accruing to spectrum rights holders while at the same time ensuring that spectrum is able to be used in its socially most valuable ways. We would know that this policy was successful if prices for spectrum were close to zero.

After all, spectrum is not an end in and of itself—people do not consume spectrum. Spectrum is an input into other services such as radio broadcasts or Wi-Fi access. Although spectrum has many different possible uses, some are incompatible. Also, all spectrum is not created equal. Some spectrum is very good for use in satellite transmissions, other frequencies are very good for narrow point-to-point transmissions, and other spectrum is very good for wider area mobile use. Consequently, Congress and the FCC should make all spectrum available for all possible uses, and thereby permit firms to make the investments that the market will bear, instead of the investments that regulators determine wise. The reason is not that regulators are ill-motivated, but that they cannot have enough information to make the necessary decisions about spectrum use.

To implement a good spectrum policy, the government should immediately make more spectrum available. The two key ways to do this are to increase the supply of spectrum outright and to get rid of use and eligibility restrictions on spectrum.

As of now, the FCC is considering auctions of various blocks of spectrum.²⁸ Some of the spectrum under consideration includes the PCS C and F block 1.9 GHz spectrum, the PCS H block in the 1915-1920/1995-2000 MHz band, 90 MHz in the 1710-1755/2110-2155 MHz bands, the 700 MHz UHF television bands, the MDS/ITFS bands and 37/42 GHz bands (37.0-38.6/42.0-42.5 GHz).²⁹ In addition, the FCC has proposed to

28. For a list of scheduled and future auctions that have yet to be scheduled, see the Auctions Web site. FCC, Auctions Summary, http://wireless.fcc.gov/auctions/default.htm?job=auctions_all (last visited Nov. 21, 2005).

29. Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services, *Tenth Report*, 20 F.C.C.R. (forthcoming 2006), paras. 75, 82,

designate the 3650-3700 MHz band for unlicensed operations.³⁰ The FCC needs to establish comprehensive rules for this spectrum. Given current advances in auction technique, it is possible to put all of the spectrum on the market at the same time and to facilitate clearing of incumbents.³¹

All of the auctions should be on a cash basis so that the FCC no longer has to act as a banker, security holder, or litigant in bankruptcy court. Immediately after the auctions, all spectrum should be freely tradable, just like the buyers at the Google IPO were able to sell their stock the same day. As discussed in virtually all FCC statements, but only put into practice in certain circumstances, the FCC should not place artificial use restrictions on the licensees. Licensees should be allowed to compete to provide whatever service they think will serve consumers' demand provided that they do not cause undue interference to other spectrum users. The FCC should not impose any build-out requirements because firms may choose to postpone investment while waiting for a market to mature or a technology to be invented or improved.

If Congress or the FCC decides on social goals that involve the use of spectrum, it should specify and quantify these goals, and then pay for them explicitly either out of general revenues or from auction revenues. For example, suppose the government wished to have over-the-air digital television made available to all Americans. It could dedicate general revenue or divert from receipts to general revenue a portion of spectrum auction revenues to pay for this outcome. Then, set-top box manufacturers and digital television makers would enter an auction to provide digital tuners in return for money, and the lowest bidder would win the subsidy.

In making spectrum available for access networks, the FCC can treat spectrum as private property, public property, or a combination of the two. The law states that the public owns the spectrum,³² but the method of

86-87 (2005), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-173A1.pdf.

30. Wireless Operations in the 3650-3700 Mhz Band, *Report and Order and Memorandum Opinion and Order*, 20 F.C.C.R. (forthcoming 2006), paras. 21 n.33, 22, available at <http://www.broadbandwirelessreports.com/pressreleases/files/FCC-05-56A1.pdf>.

31. The FCC has cosponsored three conferences with the Stanford Institute for Economic Policy Research and the National Science Foundation to refine and improve package bidding and expressive bidding techniques. The results of these conferences should improve the ability of the FCC to hold more complex auctions and lead to greater efficiency. Summaries of presentations and some of the papers presented at the conferences are available at the FCC Web site on Conferences, http://wireless.fcc.gov/auctions/default.htm?job=past_conferences (last visited Nov. 21, 2005).

32. 47 U.S.C. § 336 (authorizing the FCC to distribute licenses to operate on the spectrum in accordance with the public interest); see also *Red Lion Broadcasting v. F.C.C.*, 395 U.S. 367 (1969) (holding that the public's rights to the spectrum outweigh individual

allocation could mimic private ownership or provide open access like public parks. The government should pick the method or methods that produce the most efficient market for access networks.

As private property, the frequencies can be zoned or limited in use. The owner could subdivide, consolidate, or transfer the rights to use the property. As public property, zoning or restrictions in use could be mandated. The difference is that with private property, the owner has the right to exclude others from using the frequencies. While exclusion may sound antithetical to obtaining the maximum value of the spectrum, certain types of exclusion may help to increase the value of the spectrum because of the ability to control interference.

Generally, the property rights approach is termed a licensed approach; whereas, the public property approach is the unlicensed or commons approach.³³ A combination of the two would be the underlay approach.³⁴ With underlay rights, a licensed user might have the right to transmit on specific frequencies, but others might have the right to transmit as well, subject to certain rules that limit the interference they might cause to the licensed user.

Licensed use is a system where a user has the right to use spectrum in a designated geographic area. That user has control over the spectrum, essentially the right to exclude other users. Under the licensed approach, it is possible for the user to sublease or sublicense the spectrum use rights to others in a market transaction or to retain sole use of the spectrum.³⁵ For example, cellular and PCS providers have licenses for the use of particular frequencies in particular geographic areas.³⁶ Currently, they are the only ones with a legal right to broadcast over those frequencies. However, these rights are not comprehensive or absolute. The government still retains the ability to set technical standards or acceptable use policies in these licensed bands.³⁷ Hence, because they are not limited to preventing interference externalities, they do not match completely with a pure property rights approach in their implementation.

broadcasters’).

33. SPECTRUM POLICY TASK FORCE, *supra* note 25, at 5, 35–42.

34. *Spectrum Policy Recommendations: Comments on the Federal Communications Commission Spectrum Policy Task Force Report: Before the S. Commerce Comm.*, 108th Cong. 4 (2003) (statement of Gregory L. Rosston, Deputy Director, Stanford Institute for Economic Policy Research), <http://commerce.senate.gov/press/03/rosston030603.pdf> [hereinafter *Spectrum Policy Recommendations*].

35. SPECTRUM POLICY TASK FORCE, *supra* note 25, at 55–58.

36. *See, e.g.*, Amendment of the Commission's Rules to Establish New Personal Communications Services, *Memorandum Opinion and Order*, 9 F.C.C.R. 4957, para. 83 (1994).

37. SPECTRUM POLICY TASK FORCE, *supra* note 25, at 5.

The FCC has set aside some specific bands for unlicensed use.³⁸ In these bands, instead of a specific user being allowed to determine the use of the band, anyone who meets the equipment standards is allowed use of the band.³⁹

A third approach is the underlay licensing. This is combinable with either of the other two models of spectrum licensing. One implementation of this is known as ultra wideband, although it is not the only possible implementation of underlay use.⁴⁰ Essentially, underlay use gives users the right to use spectrum provided that they do not cause interference to the primary user or users of the spectrum.⁴¹ For example, a very low power use of spectrum might go undetected by a television broadcaster and its viewers and hence not cause any interference or degradation of the signal.⁴² Under this approach, such noninterfering signals would cause no harm and would create additional consumer benefit.⁴³ The two keys to the underlay use of the spectrum are setting the levels that would provide truly noninterfering use, and setting a method for determining how to allocate responsibility if interference occurs. In essence, an underlay system limits the rights of the licensee to specific tolerances and does not give them the right to exclude non-interfering users from using the same frequencies.

Licensed spectrum does not have to remain in the conventional licensed use. For example, an equipment firm, group of firms, or an entrepreneur may decide to participate in an FCC auction for licensed spectrum with the express intent of using the spectrum like an unlicensed commons. Companies like Cisco and Microsoft have expressed a desire for unlicensed spectrum.⁴⁴ They might be able to figure out a way to pay for the opportunity cost of the spectrum and to promote the use of unlicensed devices. If the government wants to allocate spectrum for a commons use, it would be useful to know the opportunity cost of that use by having the

38. For example, the FCC allocated 255 MHz of spectrum for unlicensed uses in 2003 in its Revision of Parts 2 and 15 of the FCC's Rules to Permit Unlicensed National Information Infrastructure ("U-NII") devices in the 5 GHz band, *Report and Order*, 18 F.C.C.R. 24484, paras. 1, 3 (2003).

39. *See id.* para. 2.

40. *Spectrum Policy Recommendations*, *supra* note 34, at 4.

41. *Id.*

42. *Id.*

43. One possible exception to the "no harm" might be from additional competition so that the additional use might cause harm to the incumbent. We ignore that harm.

44. *See* Cisco Systems High Tech Policy Guide, *Wireless and Spectrum Management*, http://www.cisco.com/en/US/about/gov/networks/wireless_spectrum_management.html (last visited Nov. 21, 2005); Microsoft PressPass Information for Journalists, *New Radio Spectrum Allocations Help to Bring Wireless Data Worldwide*, www.microsoft.com/presspass/features/2003/jul03/07-09wrc-03.msp (last visited Nov. 21, 2005).

government either participate in an auction or set a reserve price in advance. If the reserve price were not met, then the government could set the spectrum up as a commons. This would create a market test regarding the value of spectrum in a commons compared to spectrum in a more conventional licensed allocation. Such an approach could be an extension of the "band manager" concept the FCC introduced for the 700 MHz Guard Bands.⁴⁵ Indeed, the various band manager allocations should be aggregated and auctioned in this way.

None of the approaches discussed has been implemented in the U.S. in a pure fashion. For example, in the licensed approach, the government has succumbed repeatedly to politically irresistible use and eligibility requirements despite a clear cost to consumers.⁴⁶ Unlicensed use has also been subject to different power limits and etiquettes that may not be optimal.⁴⁷

Proponents of licensed use argue that markets, while not perfect, provide incentives for efficient use of spectrum.⁴⁸ Unlicensed advocates argue that the licensed approach will not create access to spectrum because incumbents would have incentives to block access to spectrum by new entrants who threaten existing businesses and business models.⁴⁹

Unlicensed advocates believe that either devices or protocols can solve interference problems sufficiently well so that no exclusion from use of a particular frequency is necessary.⁵⁰ Licensed advocates argue that the

45. See Service Rules for the 746-764 and 776-794 MHz Bands, *Second Report and Order*, 15 F.C.C.R. 5299, para. 2 (2000). See also Gregory L. Rosston, *The Long and Winding Road: The FCC Paves the Path with Good Intentions*, 27 TELECOMM. POL'Y 501, 504-06 (2003).

46. See 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*, 14 HARV. J.L. & TECH. 337, 462-71, 477-81 (2001); Rosston, *supra* 45, at 506.

47. See, for example, a proposal for new unlicensed etiquettes, Pierre De Vries & Amer Hassan, Sr. Director of Advanced Technology and Policy & Marketing Chair, Microsoft, *Spectrum Sharing Rules for New Unlicensed Bands* (Dec. 11, 2003), http://www.wifi.org/membersonly/getfile.asp?f=Spectrum_Sharing_Rules_NewUnlicensedBands.pdf.

48. Promoting Efficient use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Comments of 37 Economists* 2-4 (Feb. 7, 2001), <http://www.aei-brookings.org/admin/authorpdfs/page.php?id=176>.

49. Yochai Benkler, *Some Economics of Wireless Communications*, 16 HARV. J.L. & TECH. 25, 72 (2000); see also, e.g., Kevin Werbach, *Supercommons: Toward a Unified Theory of Wireless Communication*, 82 TEX. L. REV. 863, 915-18 (2004) (giving the example of Sprint's attempts to obstruct unlicensed access). However, it should be noted that Sprint PCS has allowed other providers such as Virgin Mobile to use its spectrum and network to provide service to customers. See <http://www.virginmobileusa.com/greatrates/howitworks.do?jsessionid=D2LvlnZp23CxXn6D2TSQj67wwgl4jQQGQ7TnQ9syczjnJ6BvF9WQv!-410112968!-839916648!7501!7502>.

50. Benkler, *supra* note 49, at 32.

problem is not likely to be easily solved nor are the solutions free—equipment requirements and protocols impose costs.⁵¹

Licensed spectrum allows users to block access to specific frequencies. With a sufficient amount of spectrum available disbursed among enough different licensees, no licensee would have an incentive to block access to another potential spectrum user that had a higher value use. Not enough spectrum is now available to dispense with this concern. Moreover, spectrum in specific bands is not a perfect substitute for other bands. Just as land next to Central Park is extremely valuable, the spectrum below 1 GHz is also very valuable. It is valuable because of its propagation characteristics and because the handset equipment and the equipment necessary to deploy a network is substantially cheaper than the equipment required in higher bands.

We think that other mechanisms can provide better use of the federal government spectrum in the longer term, and such mechanisms should be encouraged today. For example, the United Kingdom has attempted to force government agencies to realize at least some of the opportunity cost they impose through their use of spectrum by charging each agency a fee for the use of the spectrum.⁵² One task for the proposed independent commission would be to reach agreement on which spectrum should be licensed, unlicensed, or subjected to a hybrid approach. The goal in such debate should be maximizing the amount of spectrum used to provide access network solutions, so as to facilitate the most competitive access market and to expedite the deregulation of retail pricing for all communications services.

B. Access Network Competition and Unbundling

The intent of the Telecommunications Act of 1996 was to create competition in the access market, as well as long distance, without belying the economies of scale, scope, and density that exist for networks.⁵³

51. See Bruce M. Owen & Gregory L. Rosston, *Spectrum Allocation and the Internet*, in *CYBER POLICY AND ECONOMICS IN AN INTERNET AGE* (W. Lehr & L. Pupillo eds., 2002), available at <http://siepr.stanford.edu/papers/pdf/01-09.pdf>.

52. Martin Cave, Professor, An Independent Review for Department of Trade and Industry and HM Treasury, Review of Radio Spectrum Management 26 (March 2002), http://www.see.asso.fr/ICTSR1Newsletter/No004/RS%20Management%20-%202_title-42.pdf. As discussed above, the opportunity cost imposed by government use of the spectrum is the value of the precluded commercial service that could otherwise make use of the spectrum. *Id.* at 16–17.

53. Telecommunications Act of 1996, 47 U.S.C. §§ 251–252 (2002) (governing development of competitive markets in the local exchange service). See also Gregory Rosston, *The Telecommunications Act Trilogy*, 5 *MEDIA L. & POL'Y* 1, 1–12 (1996) (discussing the economic barriers for local exchange carriers before the 1996 Act and what

Meanwhile, the Act intended to share, by law, among rivals.⁵⁴ The Act did this by providing three different modes of entry—facilities based entry including but not limited to wireless and cable voice, entry using unbundled network elements, and resale.⁵⁵ The techniques of the Act focused on sharing certain facilities of the incumbents with their rivals, including but not limited to elements of the access network, directories, central offices and numbers.⁵⁶

Facilities-based entry, no matter how extensive the facility, depends on fair charges to interconnect and exchange traffic with the incumbent. A new entrant can compete by leasing portions of the incumbents' networks only if the price for the lease is low enough to compare to the incumbents' true operating cost, which means that the price has to be forward-looking.⁵⁷ And resale, for a reasonable duration, can be a mode of entry only if the margin between wholesale and retail is large enough to permit the reseller to cover costs. These simple postulates lead to important debate over the appropriate price for interconnection, termination of traffic, leasing, and wholesale purchase. In the eight years between 1996 and 2004, the FCC has changed its mind on such prices from time to time,⁵⁸ courts have interfered repeatedly in such pricing,⁵⁹ states have injected distinct and different decisions on these issues,⁶⁰ and in general investors have not had a clear and consistent answer to the question of what price new entrants would have to pay for interconnection, termination, leasing, or wholesale.

As of the end of 2004, indecision and confusion on this topic reign at the FCC. No state has the capability to promulgate or enforce a regime that can have a significant national effect. As to big bandwidth networks, the

the 1996 Act did to promote competition).

54. 47 U.S.C. §§ 251–252 (2002).

55. *Id.* at § 251.

56. *Id.*

57. See generally Gregory L. Rosston & Roger Noll, *The Economics of the Supreme Court's Decision on Forward Looking Costs*, REV. NETWORK ECON. 81 (2002) (explaining forward-looking pricing rules, their rationale and implications).

58. See, e.g., Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, *First Report and Order*, 11 F.C.C.R. 15499 (1996), *reconsidered by Order on Reconsideration*, 11 F.C.C.R. 13042 (1996), *reconsidered by Second Order on Reconsideration*, 11 F.C.C.R. 19738 (1996), *reconsidered by Third Order on Reconsideration and Further Notice of Proposed Rulemaking*, 12 F.C.C.R. 12460 (1997) (showing the FCC's change in its stance on interconnection from 1996 to 1997).

59. See, e.g., *Iowa Utils. Bd. v. FCC*, 120 F.3d 753 (8th Cir. 1997), *aff'd in part and remanded*, *AT&T v. Iowa Utils. Bd.*, 525 U.S. 366 (1999).

60. For a summary of such different pricing, see Billy Jack Gregg, *A Survey of Unbundled Network Element Prices in the United States*, <http://www.cad.state.wv.us/Une%20Page.htm> (last visited Nov. 21, 2005).

FCC has determined to abandon at least unbundled elements and wholesaling as techniques for introducing competition in access networks.⁶¹ Meanwhile, competitors hoping to offer either wireless or VoIP do not need leasing or wholesale, although other regulations are desired by new entrants offering these services.

Soon, Congress and the FCC need to decide whether to maintain or disband unbundling and wholesaling. Although these techniques might be useful in some market situations, history shows that FCC vacillation and judicial interference produce such negative results for industry conduct and performance⁶² that perhaps other more reliable techniques for introducing competition now should be preferred. The problem, in any case, remains the same: obtaining maximally beneficial performance from access networks is difficult in light of the economics of these networks.

C. Competing Access Networks Require Interconnection

Regardless of the structure, conduct, and performance of the access market, different originating service providers will always need to send communications to terminating service providers. However, in the case of any particular instance of communication, the originator may not have a choice of terminators. Suppose for example that the consumer elected the telephone company's line as its choice of access. Anyone wishing to communicate to that consumer would be obliged to connect, directly or indirectly, to that consumer's telephone company. But, that company could then charge a monopoly price to the incoming caller. If all companies behaved in this manner, the total effect would be monopolistic pricing, thereby defeating the purpose of access network competition.⁶³ Moreover, firms with relatively larger customer networks could choose to charge discriminatory prices to smaller originating firms, so as to drive small firms out of business. Other tactics that would deter competition can be imagined and have been practiced in the history of communications.⁶⁴ To preclude

61. Unbundled Access to Network Elements, *Order on Remand*, 20 F.C.C.R. 2533, para. 29, 34, 48, 62–63 (2005), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-290A1.pdf.

62. See, e.g., Stanley M. Besen & Robert Crandall, *The Deregulation of Cable Television*, 44 LAW & CONTEMP. PROBS. 77 (1981) (discussing FCC vacillating regulation of cable television).

63. See Joseph Farrell, Former Chief Economist, FCC, *Prospects for Deregulation in Telecommunications: Mildly Revised Version* (May 30, 1997), <http://www.fcc.gov/Bureaus/OPP/Speeches/jf050997.html>.

64. For example, AT&T's discrimination against its long-distance rivals was the basis for the breakup. See generally Roger G. Noll & Bruce M. Owen, *The Anticompetitive Uses of Regulation: United States v. AT&T*, in *THE ANTI-TRUST REVOLUTION* 290 (John Kowka & Lawrence White eds., 1989) (discussing AT&T's anticompetitive efforts).

such means to an anticompetitive end, government needs to provide a competitive benchmark for intercarrier compensation—the charges firms will pay each other for terminating calls.

To this end, in 2004, a group of local exchange providers, long-distance companies, and competitive-service providers presented the FCC with a proposal that could eventually become a bill to solve the voice traffic problem.⁶⁵ Although the proposal is more detailed than this Article's level of discussion, its essence is to have every originator charge its customer for access and to lower charges for interconnecting among originators (i.e., to lower termination charges) very close to zero.⁶⁶ Of course, carriers could enter into other arrangements voluntarily. The proposed commission should consider this proposal, among others, and recommend adoption of this or a similar notion to the FCC. Congress should mandate that such a plan be put into place. It should preempt any state regulation, especially since the contemplated communications will freely cross state lines.

The reduction of interconnection charges to zero has been termed "Bill and Keep."⁶⁷ A Bill and Keep system addresses the terminating monopoly problem discussed above and means that network service providers charge their own customers for connection and traffic charges, but do not compensate other networks for the termination of cross network traffic.⁶⁸ A Bill and Keep system will not be optimal in all circumstances.⁶⁹ However, Bill and Keep moves prices closer to a situation where customers pay for their own connection and face the cost of the choices they make. If a customer chooses a wireless provider with per-minute rates as opposed to a wireline provider with a higher fixed monthly fee, the customer making the choice would be faced with the cost of that choice under the proposed system. Also, current regulatory charges that are not cost based, such as above cost per-minute access charges, create distortions in the marketplace

65. Letter from Gary M. Epstein & Richard R. Cameron, Counsel for The Intercarrier Compensation Forum, to Marlene Dortch, Secretary for FCC, Notice of Ex Parte Communication (Aug 16, 2004), <https://neca.org/media/ICF082004.pdf>.

66. *Id.*

67. See Patrick DeGraba, *Bill and Keep at the Central Office As the Efficient Interconnection Regime* para. 15 (FCC Office of Plans and Policy, Working Paper, 2000), http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp33.pdf (describing Bill and Keep as a default internet connection regime not allowing a called party's carrier to charge an interconnecting carrier to terminate a call and making the calling party's network responsible for the cost of transporting the call).

68. *Id.*

69. For extensive discussion of the situations where optimality is and is not achieved, see generally Patrick DeGraba, *Reconciling the Off-Net Cost Pricing Principle with Efficient Network Utilization*, INFO. ECON. & POL'Y 475 (2004).

that cause consumers to make inefficient choices. These distortions in consumer choice ultimately lead to inefficient network design and investment decisions as well. With a more cost-based system, competition should minimize these inefficiencies, especially when firms have the ability to negotiate alternative arrangements.

III. SERVICE COMPETITION

A. *Openness*

If access network providers have market power, the question arises as to whether the access network will be open to all users and information providers. At least three kinds of openness have provoked a great deal of debate in the last decade. The first concerns whether software protocols for using the network should be visible to new firms that might want to emulate them and to application providers that might want to write software that interoperates with such protocols. The second addresses the ability of any firm, including a competitor of an access network proprietor, to transmit over the access network—for example, whether anyone can send an e-mail over a consumer's access network—or by contrast may the access provider close the network to some would-be transmitters. The third relates to whether any terminal, or customer premises equipment, can be attached to the access network, or by contrast whether the access provider may discriminate among different terminals. None of these questions is easy because mandating openness even as to firms with market power may deter investment by that firm or restrict its ability to provide services more efficiently in an integrated manner.

As to the first question, the history of cellular argues for the merit of relying on the marketplace to set standards, even if they are proprietary and not open. The FCC chose the transmission standard for the first generation of cellular service, analog.⁷⁰ But subsequently, the government actively declined to mandate a transmission standard.⁷¹ Qualcomm was able to develop a proprietary standard from which it obtains license fees to this day.⁷² Qualcomm's standard competes in the marketplace with other

70. Cellular Telephone Service, <http://www.decodesystems.com/mt/96nov//> (last visited Nov. 21, 2005); Gregory Rosston, *An Economic Analysis of the Effects of FCC Regulation on Land Mobile Radio* (1994) (unpublished Ph.D. Dissertation, Stanford University) (on file with author).

71. See Amendment of the Commission's Rules to Establish New Personal Communications Services, *Memorandum Opinion and Order*, 9 F.C.C.R. 4957, paras. 159–62 (1994).

72. Qualcomm Technology and Solutions, CDMA 101, <http://www.qualcomm.com/technology/cdma101.html> (last visited Nov. 21, 2005).

competitive standards. The returns to successful investment are consistent with a market-based approach. We suggest then that with respect to communications protocols, the government should permit and encourage standards competition. However, if a standard achieves monopoly status, apart from the limited terms of patent protection, it might frustrate new entry and further standards competition. In that event, traditional antitrust principles can be used to limit the effects of monopoly. In this respect, antitrust officials must recognize that network effects can give an incumbent substantial market power. In any event, interconnection policy, as set forth below, will also be a necessary antidote to competition problems.

The second kind of openness—non-discrimination as to content—has been law with respect to the telephone network and practice, sans law, with respect to the Internet.⁷³ Again, as of now, it appears that the government need not mandate this kind of openness. However, the government should reserve the right to declare it obligatory as a matter of law. Specifically, that would mean applying Title II of the Telecommunications Act to all networks, but forbearing from the specific enforcement of its provisions unless and until inefficient results occur.⁷⁴

Two arguments are asserted in favor of ordering openness immediately. First, some firms want access to physical portions of the incumbents' access networks. In effect, this is a claim for partial leasing or occasional wholesale purchasing, and harkens back to the problems of the 1996 Act illuminated above. Second, others—advocates of “net neutrality”—ask for a government mandate that now and forever the owner of the access network may not restrict the ability of its end user customers to access specific content or to run particular applications.⁷⁵

For those who are inclined to think instantly that this argument has merit, consideration should be given to the fact that the government hardly ever tells a retailer that it cannot refuse to put on its shelves anything any

73. Jason Oxman, *The FCC and the Unregulation of the Internet* 12–13 (FCC, Office of Plans and Policy, Working Paper No. 31, 1999), http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp31.pdf.

74. This would mean that all of the networks would be considered telecommunications services providers and potentially subject to regulation as such. By putting all networks under the same framework, there would no incentive to try to distinguish one's network to avoid regulation.

75. François Bar et al., *Defending the Internet Revolution in the Broadband Era: When Doing Nothing is Doing Harm* 4 (Berkeley Roundtable on the International Economy, E-economy, Working Paper No. 12, 1999), <http://e-economy.berkeley.edu/publications/wp/ewp12.pdf>; see also Tim Wu, *Network Neutrality, Broadband Discrimination*, 2 J. ON TELECOMM. & HIGH TECH. L. 141 (2003) (comparing the general approaches of broadband regulation and favoring less intrusive measures).

customer wants or ever tells a publisher that it must print any book any reader asks for. Nevertheless, serious attention should be paid to the contention that this form of openness would maximize both investment and individual freedom.⁷⁶ In addition, advocates of this approach assert that content creation would be maximized if all information were accessible without technical, substantive, or price alteration from the originator of the information.⁷⁷ The direction of this argument is that high-speed access facilities—the local cable, DSL, fiber facility, and in the future, wireless carriers—should essentially be common carriers and should not be able to exclude anyone or any content from the local or backbone portions of the Internet.

The fear of “open access” advocates is that local broadband providers such as DSL and cable modem services could be bottlenecks, threatening the openness objectives. Of course, the pursuit of bottleneck status, from which rents can be garnered, is in fact the goal of competitors in competitive markets. Using law to preclude winning in competition can discourage investment and hence lead to less efficient networks, producing suboptimal results for the economy.

Nevertheless, the open access argument typically does not object to an access network “winning” in competition, but instead to any network provider marrying transmission with content.⁷⁸ The objection has a “Back to the Future” quality since its proponents object scarcely at all to monopoly at the physical layer, or tangible access network, and protest vigorously almost any unique commercial combination by the access network provider of transmission with content, or even with the software protocols that permit transmission.

Of course, insofar as a telephone call is content, telephone networks have since Bell’s patents combined content and conduit. Furthermore, the open access argument requires not only open conduits, but also a legal mandate that new versions of the Internet, or for that matter new versions

76. For general support that network neutrality will improve openness and investment, see generally LAWRENCE LESSIG, *THE FUTURE OF IDEAS: THE FATE OF THE COMMONS IN A CONNECTED WORLD* (2001); *The Government’s Role in Promoting the Future of Telecommunications Industry and Broadband Deployment: Hearing Before the S. Comm. on Commerce, Science & Transp.*, 107th Cong. (2002) (statement of Lawrence Lessig, Prof. of Law, Stanford Law School), available at <http://commerce.senate.gov/hearings/100102lessig.pdf>.

77. See Michael K. Powell, Chairman, FCC, Remarks at the University of Colorado School of Law Boulder: The Digital Broadband Migration: Toward a Regulatory Regime for the Internet Age 3 (Feb. 8, 2004), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-243556A1.pdf.

78. See generally Bar et al., *supra* note 75, at 1 (arguing that FCC’s enduring openness and competition policy has created the widest array of choices for the consumer).

of any network access, be subject to a legal decree that they be backwards compatible. Only in this way can content on today's networks use tomorrow's.⁷⁹

Currently, as discussed above, neither cable firms nor DSL companies appear to be excluding content to a large degree. However, cable and DSL firms have suggested that they might treat other content providers in a discriminatory fashion, just as Microsoft has also done with respect to its operating platform.⁸⁰ Whether such discrimination, hypothetical or actual, is anticompetitive, reasonable people have debated without reaching consensus.

If open access becomes a large problem in the future, or if it becomes clear that a single provider of broadband access will have a monopoly, then policymakers should have the ability to step in to undertake corrective measures at the time. To this end, the FCC should declare all access networks subject to Title II regulation as discussed above. The FCC gains maximum flexibility—it can and should forbear from regulation should the market prove to be sufficiently competitive. At the same time, should market power problems arise that can be safely solved with government intervention, it has the flexibility to act.

The third kind of openness—the right to attach any appliance to the network—has been advocated by the High Tech Broadband Coalition.⁸¹ Consumers should be able to attach any device to the network that does not harm the network and works within the rules of the service the consumer has purchased. Similar issues have been debated in the past with respect to the telephone network.⁸² When the FCC required AT&T to allow third party equipment to hook up to the network, consumers benefited from the

79. See generally Bruce M. Owen & Gregory L. Rosston, *Local Broadband Access: Primum Non Nocere or Primum Processi? A Property Rights Approach*, (Stanford Inst. for Econ. Policy Research, Discussion Paper No. 02-37, 2003), <http://siepr.stanford.edu/papers/pdf/02-37.pdf> (discussing the economics of open access).

80. See Nondiscrimination in the Distribution of Interactive Television Services Over Cable, *Comments of The National Cable Television Association* 50 (Mar. 19, 2001) (arguing that mandatory nondiscriminatory access policy is unconstitutional), http://ncta.com/pdf_files/CS_Dock_01-7Comments.PDF.

81. Appropriate Regulatory Treatment For Broadband Access to the Internet Over Cable Facilities, *Comments of High Tech Broadband Coalition* 9 (June 17, 2002), http://www.ce.org/shared_files/recent_actions/75COM%20Cable%20Modem%20Service%20FINAL.pdf.

82. Historically, AT&T blocked the attachment of "foreign" devices even though they caused no harm to the network. See *Hush-A-Phone Corp. v. United States*, 238 F.2d 266, 267-69 (D.C. Cir. 1956). The FCC later decided to allow non-AT&T equipment to be used in the network. See *Use of the Carterfone Device in Message Toll Telephone Service, Decision*, 13 F.C.C.2d 420, 426 (1968), *reconsideration denied, Memorandum Opinion and Order*, 14 F.C.C.2d 571 (1968).

additional competition and choice.⁸³ It may be reasonable for the network owner to charge differential pricing for different services, but equipment discrimination is less likely to have the same positive benefits so that this openness should be adopted by law and regulation.

Before leaving this important topic, we should note that a different way to discuss openness is the structural approach. Two varieties of restructuring access networks can be identified. The first restructured openness is the separation of any network between a firm owning access and a firm owning the switch and the switch-to-switch connection.⁸⁴ This separation roughly equates to edge as opposed to core portions of any network. Some contend that law or regulation should mandate such structural separation.⁸⁵ The contention falters, however, on these points: (1) cellular networks, for example, do not show such clean demarcation points, and therefore, such a structural remedy might not be evenly applied to all networks, raising the possibility that inefficient or biased competition might result; (2) even if structurally separated, an access network owner could attempt to exercise monopoly market power over termination and, therefore, would have to be subjected to the regimes outlined above, raising the possibility that the separation might be fruitless; (3) data traffic can be routed in various ways that might defeat the goals of such separation; (4) structural separation may cause more harm than good in terms of new investment and efficiency because it would restrict integrated service provision; (5) with competing networks structural separation may not provide any consumer benefits that would offset the costs of nonintegration.

The second kind of structural openness is the division of a network into a physical layer, a communications protocol layer, and a service or application layer. The contention here would be that the bottom layer could be a regulated monopoly, the middle an open and free software stack, and the top a field for unregulated competition.⁸⁶ This paradigm is appealing in

83. GERALD W. BROCK, *THE SECOND INFORMATION REVOLUTION* 181 (2003).

84. The switch-to-switch connection is loosely referred to as backbone. Kevin Werbach, *Digital Tornado: The Internet and Telecommunications Policy* 10–12 (FCC Office of Plans and Policy, Working Paper No. 29, 1997), http://www.fcc.gov/Bureaus/OPP/working_papers/oppwp29.pdf.

85. Robert E. Hall & William H. Lehr, *Rescuing Competition to Stimulate Telecommunications Growth* 28–31 (Sept. 28, 2001) (White Paper prepared on behalf of AT&T), <http://www.techcentralstation.com/media/docs/hlpaper.pdf>.

86. See Richard S. Whitt, *A Horizontal Leap Forward: Formulating a New Communications Policy Framework Based on the Network Layers Model*, 56 *FED. COMM. L.J.* 587, 590–92 (2004) (discussing this view). But see Adam D. Thierer, “Net Neutrality” *Digital Discrimination or Regulatory Gamesmanship in Cyberspace*, 507 *CATO INST. POL’Y ANALYSIS* 1 (2004), available at <http://www.cato.org/pubs/pas/pa507.pdf> (advocating for

the abstract, but plagued by the need for the same sort of regulations at the physical layer as applied above to an integrated access network where one firm owns all three layers. If this form of openness does not produce more competition with less regulatory cost, perhaps it accomplishes less than its advocates would prefer. In any event, this is a topic that should be studied seriously by the proposed independent commission.

In that discussion, it is also important to note that, as with patent policy, providing incentives for investment in the network is also important. To the extent that profits at different levels provide the necessary returns, then a structural openness policy may be counterproductive.⁸⁷ Also, structural separation may be difficult to implement when network technology is in flux or may affect network design while reducing the ability to coordinate product development across layers.

B. VoIP as a Case in Point

Much regulatory angst and competitive fervor is currently engendered by the 4 letters—VoIP. VoIP, Voice over Internet Protocol, is a way of transmitting voice calls as data packets over the packet-switched Internet data network, which is an alternative to routing voice calls as circuit-switched calls over the telephone network. Companies like AT&T, Vonage, Packet 8, and Skype are providing VoIP services. The incumbent telephone and cable companies are also initiating VoIP offerings.⁸⁸ These generally offer a host of features along with attractive long distance calling plans.

In the future, a larger portion of voice communications will be part of the Internet data stream, along with music and movies. So in this sense voice will go over the Internet, using Internet protocols to describe beginning and ending calls, and to pick the route of the traffic on the way from originator to terminator. Because voice traffic uses only a small amount of bandwidth, especially compared with applications like music and movies, the marginal cost of VoIP voice traffic is likely to be extremely low.

State regulators fear VoIP because, as currently priced and regulated, it threatens the sources of funding for universal service programs. Incumbent telephone service providers view VoIP both as a threat and as

vertical integration).

87. See generally Owen & Rosston, *supra* note 79.

88. For example, Verizon is offering "VoiceWing." Verizon VoiceWing FAQs, <https://www22.verizon.com/ForYourhome/voip/FAQ.aspx?LOBCode=C&PromoTCode=VWS02&PromoSrcCode=L&POEId=TL1FH> (last visited Nov. 21, 2005).

an opportunity. The threat is to their existing businesses; the opportunity is in selling new services and having the ability to avoid entrenched regulations.

Instead of treating VoIP as a threat, regulatory authorities should view it as an opportunity to reformulate the existing regulations that do not serve the purposes of efficiency and social welfare. Instead of trying to push VoIP into the tent with historic switched access service and the attendant inefficient access charge regime, regulators should explicitly and rapidly rule out access charges for all traffic and move to a more efficient method for revenue collection.

A revamped system would remove the fears of the regulators and enhance the opportunity for providers and more importantly for consumers. By setting a stable system that focuses universal service revenue and cost in a directed system, the threats from arbitrage would be minimized. In addition, the need for extensive programs would be reduced. In all, while regulators would oversee smaller programs, these programs would be more stable and more effective at achieving the goals of universal service.

IV. NETWORK EFFECTS, ECONOMIES OF SCALE, AND UNIVERSAL SERVICE

A. *More Valuable for All Users*

According to a so-called law attributed to one of the founders of modern Internet communication, Bob Metcalfe, the value of a network equals the square of the number of users.⁸⁹ This formula is more an opinion than a mathematically valid proposition. However, it expresses the intuitive observation that any new participant in any network adds to the value of the network for each existing user because all the old subscribers now have one new subscriber to call. Since the value of the network accretes as subscribers are added, the willingness of subscribers to switch to a new network declines unless an interconnection right, as described above, exists. In addition, a network provider ought to be motivated to add new subscribers at declining prices if the provider can charge less to the new user than to the old ones. In fact, network operators have a strong motivation to try to attract additional subscribers to increase the value to existing customers, increasing existing customers' willingness to pay. In

89. More precisely, Metcalfe's law states that the number of connections is proportional to the square of the number of users. The number of possible connections in a network is $N^2 - N$, which approaches N^2 as N gets larger. This does not place a value on the additional connections. See NEWTON'S TELECOM DICTIONARY 555-56 (16th ½ ed. 2000).

unregulated markets—such as what communications should become—one practical way for the seller to achieve this result is to use temporary discounts, long-term contracts with scaled-up fee structures, and other marketing and pricing techniques that in effect create differential pricing. These tactics maximize value for the economy and society. Policy should support, not ban, such means of delivering service.

Moreover, policy should aspire to induce subscriptions from those who lack a willingness or capability to pay for network access because even bringing the recalcitrant or impecunious user on to the network creates more value for existing users. To this end, subsidy programs that bridge the gap between what a customer can or will pay and the price offered can be economically beneficial. From the perspective of social benefits, delivery of such government services as medical advice, education, public safety, and other services often can be done efficiently over a network. Therefore, bringing everyone on to at least one access network can serve social goals. Furthermore, a ubiquitous network can also serve social goals.

The question, then, is not whether a universal service program—defined as a network in which everyone can participate, anytime, from anywhere—is a good idea, but how society, acting through government and through private firms, can put in place such a program with the minimum amount of money spent in order to achieve the maximum social and economic benefit. Anyone can recognize that to meet this goal the social benefit will have to be quantified, so as to be expressed in the same terms as the cost and economic benefits. However, many tools exist to make such quantifications, and this paper need not address that topic. Our concern, instead, is that no such program has been proposed by the government. Moreover, the existing mishmash of policies and programs that are called universal service plainly fall grossly short of the desired goal.

The current universal service policies have many defects. They include at least the following:

(1) The allocation of universal service objectives to both federal and state jurisdiction produces confusing and inefficient practices and widely varying outcomes in different states.⁹⁰

(2) In general, urban consumers pay more than they would in an efficient market, and, in effect, pay an implicit tax that is awarded to rural

90. Gregory L. Rosston & Bradley S. Wimmer, *The 'State' of Universal Service*, 12 INFO. ECON. & POL'Y 261, 282 (2000), available at http://www.sciencedirect.com/science?_ob=MIimg&_imagekey=B6V8J-416C1V7-5-1&_cdi=5872&_user=1105409&_orig=-browse&_coverDate=09%2F30%2F2000&_sk=999879996&view=c&wchp=dGLzVzz-zSkzk&md5=9f5c08325e5342ff8d646e17700d3819&ie=/sdarticle.pdf.

users who in turn are asked to pay less than they are willing to pay. This transfer from urban to rural ignores the fact that many urban residents have low incomes and many rural residents have high incomes. The result overall is to reduce the amount consumers would be willing to pay for communications services and the quantity of network usage.⁹¹

(3) Universal service programs create incentives for firms and consumers to elect ways to bypass existing collection mechanisms, thereby creating inefficient competition and inequitable collection of funds to pay for social benefits.⁹²

(4) Universal service subsidies in general perpetuate the maintenance of the oldest features of communications services, instead of providing an incentive for firms to build the most efficient networks.⁹³

Congress should mandate a complete overhaul of universal service, according to the precepts set by the independent commission proposed herein. These precepts must include the following at an absolute minimum: all implicit and indirect subsidies should be absolutely banned; all jurisdiction for universal service funding should be vested in the federal system; and all implementation should be done by state authorities, according to federal guidelines. Social benefits must be quantified and added by formula to economic benefits so as to be balanced with costs.

B. Most Efficient

A key to a wise universal service policy is to use funding to catalyze the construction of the most efficient networks. In some cases the outcome may be construction of all or mostly fiber networks to the premises of users. In some instances wireless networks will be optimal. In still other situations, a mixture of wire and wireless will be desirable.

In any case, auction techniques can be used to minimize universal service subsidies while at the same time guaranteeing a level of service. Many of these issues were explored by the FCC at the time of initial implementation of the Telecommunications Act of 1996.⁹⁴ Auction techniques show promise for substantially increasing the efficiency of

91. Gregory L. Rosston & Bradley S. Wimmer, *Winners and Losers from the Universal Service Subsidy Battle* (Stanford Inst. for Econ. Pol'y Research, Working Paper No. 99-8, 1999, in *THE INTERNET UPHEAVAL: RAISING QUESTIONS, SEEKING ANSWERS IN COMMUNICATIONS POLICY* 401-404 (Ingo Vogelsang & Compaine, eds., 2000).

92. Gregory L. Rosston & Bradley S. Wimmer, *The ABC's of Universal Service: Arbitrage, Big Bucks, and Competition*, 50 *HASTINGS L.J.* 1585, 1586-88 (1999).

93. Hundt, *supra* note 5.

94. See Federal-State Joint Board on Universal Service, *Report and Order*, 12 F.C.C.R. 8776, para. 70 (1997).

universal service payments.⁹⁵ It is time to pursue these techniques.

Federal and state governments already provide a number of different universal service programs. For example, low-income and high-cost households, schools, and libraries are explicitly targeted as subsidy receivers.⁹⁶

The Telecommunications Act of 1996 created the schools and libraries fund.⁹⁷ Unlike the other subsidy funds, this fund is directly related to Internet access. This amounts to \$2.3 billion per year.⁹⁸ This money has connected the vast majority of classrooms in the country.⁹⁹ The money is currently being used to subsidize the costs of continuing the Internet connections in the classrooms, substantially classrooms for schools in lower income areas.¹⁰⁰ This program could be expanded to include funding of broadband and equipment for classrooms. Among its positive attributes are the use of competitive bidding to obtain the lowest price for access services and the use of matching grants by end users so as to assure a sincere desire for the access.

Universal service at any level will require funding. An essential aspect of a wise policy is not to mandate that any service provider lower prices or alter service offerings to achieve universal service. Nor should the burden of providing universal service be assigned to one or more service providers. Instead, funds should be placed in the hands of users, such as

95. See generally Paul Milgrom, Procuring Universal Service: Putting Auction Theory to Work, Lecture at the Royal Swedish Academy of Sciences (Dec. 9, 1996) (providing an optimal auction for universal service), <http://www.market-design.com/files/milgrom-procuring-universal-service.pdf>.

96. Lifeline provides a subsidy, about \$680 million per year, to reduce the cost of monthly service for low-income households. INDUST. ANALYSIS & TECH. DIV., FCC, TRENDS IN TELEPHONE SERVICE 19-12 chart 19.4 (2004), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend504.pdf. Federal Linkup, which provides about \$30 million per year for federal payments, matched by state subsidies, reduces the initial hookup charges for telephone service for low income households. *Id.* The FCC and states also have different high-cost fund subsidy programs. Currently, explicit high-cost funding is \$3.5 billion dollars per year. See Universal Service Fund: Estimated Annual Support Amounts Based on Projections for 1st Quarter, 2004 (showing \$3,584,403,813 for "All Companies" "Total"), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-03-4071A2.xls (last visited Nov. 21, 2005).

97. 47 U.S.C. § 254 (2000).

98. Universal Serv. Admin. Co., 2004 Annual Report 1, available at <http://www.universalservice.org/download/pdf/2004AnnualReport.pdf> (showing "Schools and Libraries Support" in billions of dollars) [hereinafter 2004 Annual Report].

99. Jay Rockefeller, Senator, U.S. Senate, Written Statement for Senate Commerce Hearing on the E-Rate (Oct. 4, 2004) ("The most recent statistics for classroom connection are amazing—92% of all classrooms are connected, and 89% of the poorest classrooms are connected."), <http://www.ala.org/Template.cfm?Section=erate&Template=/ContentManagement/ContentDisplay.cfm&ContentID=77007>.

100. 2004 Annual Report, *supra* note 98.

through assignable credits. To generate the funds, government should go to a common pool of revenue that is drawn equitably from a base that is not tilted toward or against any particular provider. The reason is to assure that inefficient competition is not a byproduct of universal service.

Examples of reasonable funding sources include a flat tax on all communications users, assignment of monies from a general pool of revenues, a sales tax on all communications services, and tax credits assignable to any and all providers through competitive processes.

V. PRACTICAL PROCESS

A. *National Versus. State Jurisdiction*

Seventy years ago, long before the Internet and even before widespread long-distance calling, when communications were predominantly local, Congress decided that communications should be regulated primarily on a state level.¹⁰¹ But now, virtually all business and consumer uses of communications freely and regularly cross state lines. Under these circumstances, the right answer is to assign national decisions to federal jurisdiction and local decisions to local authorities.

Federal regulatory authorities should set interconnection and openness policies, should deregulate retail pricing, and should assure procompetitive market structures. Local jurisdictions should assure that rights of way and other public property rights are available to all service providers, consistent with a general federal mandate. The physical infrastructure is necessarily local, but the use of the system is inherently national or even worldwide. In essence, consumers should now pay for access to a network that allows them to communicate anything to anyone anywhere. Far too much litigation has already consumed time and meaning to no rational end result of jurisdictional allocation. It is time for Congress to show the insight and will to mandate a sensible ordering of responsibilities.

B. *FCC Organization*

1. Staff

The FCC has suffered, from time to time, a reputation for agency capture by special interests, mind-boggling delay, internal strife, lack of competence, and a dreadful record on judicial review. Much of the

101. See Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1046 (1934) (current version at 47 U.S.C. § 152(b) (2000)) (denying FCC jurisdiction over many carrier issues).

reputation is unfair; some is accurate. Reform steps have long been discussed, but long delayed. An essential aspect of a wise communications policy is the creation of an adept and effective regulatory, or rather, deregulatory agency. To this end, the FCC should be about half the size, and about half the personnel should be engineers, economists, and other technical advisers, as opposed to lawyers. No field offices or other industry support groups should exist.

Preferably, the agency should be headed by one commissioner and not a group of five. The single commissioner ought to serve for a five-year term and not be eligible for renewal. Also preferably, the job would be nonpartisan. The commissioner should be given *Chevron* deference¹⁰² by the court of appeals, as a matter of congressional mandate. Congress should annually review the commissioner's performance in a written assessment. An independent bipartisan commission should review the same performance every other year in a published, detailed report.

2. Gathering Data

The FCC should be more aggressive in its use of its ability to gather and subpoena information. Subject to appropriate protections for confidentiality, it should make such industry information available on a timely basis. In addition it should publish detailed reports on an annual basis concerning network usage, engineering efficiency, pricing for any and all communications services, network outages, and other information pertinent to any disinterested observer's scrutiny of the networks.

Instead, the FCC has limited exposure of network outages.¹⁰³ Either the FCC or Congress has occasionally limited—officially or through behind-the-scenes pressure—agency power to gather information.¹⁰⁴ As networks evolve, the FCC has done an increasingly poor job of gathering and reporting information. That trend needs to be reversed.

The FCC's Web site is badly in need of change to make it more accessible and easier for outsiders to find relevant information. Web links should be mandated in all documents. Every party petitioning the FCC should put its filings on its Web site in the same standardized, non-PDF format, subject to open search techniques.

102. See *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984).

103. New Part 4 of the Commission's Rules Concerning Disruptions to Communications, *Report and Order and Further Notice of Proposed Rulemaking*, 19 F.C.C.R. 16,830, para. X, *Order Granting Partial Stay*, 19 F.C.C.R. 25,039, para. 3 (2004).

104. See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, *Eighth Report*, 18 F.C.C.R. 14,783, 14,927 (2003) (statement of Comm'r Copps, concurring), http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-150A2.pdf (discussing the FCC's inability to gather data).

The Freedom of Information Act¹⁰⁵ should be amended to permit any commissioner to discuss any matter confidentially with any other commissioner, assuming that Congress fails to reduce the number of commissioners to one.

3. Culture

The FCC's reversal rate in the courts is scandalously high.¹⁰⁶ Congress should require quarterly reporting to the public on the reversal rate. In the event that it rises above 50% for any three of four sequential quarters, all commissioners sitting during those three quarters should be obliged to leave office within a quarter thereafter.

Commissioners should be obliged to receive one month of intensive training after confirmation before they can assume their seats and vote in FCC matters. All commissioners should be instructed at least rudimentarily in economics, antitrust, network operation, and administrative procedure. Congress should be obliged by law to vote on confirmation of commissioners within ninety days of their appointment.

The FCC's General Counsel should sign any decision by the FCC, certifying that he or she believes that it complies with law.

The agency should be required by Congress to provide training funds equal to a fixed amount per employee per year. Employees who do not obtain training on a regular basis should be terminated. Every two years a mandatory minimum number of employees—to be set by the proposed independent commission—should leave the agency, either voluntarily or by compulsion, and be replaced by new hires with up to date technical competence in law, engineering, economics, or other appropriate disciplines.

The agency should be reorganized forthwith according to functions with industry silos disbanded. No employee should be permitted to remain within a particular functional unit for more than five years.

C. *Antitrust Enforcement*

Communications, like all other sectors of the economy should be subject to the antitrust laws. The *Trinko*¹⁰⁷ decision notwithstanding, Congress should make it clear that the Telecommunications Act and other

105. 5 U.S.C. § 552 (2000).

106. See *Prometheus Radio Project v. FCC*, 373 F.3d 372 (3d Cir. 2004) (remanding the FCC's cross-media ownership limits decisions for justification or modification), *cert. denied*, 125 S.Ct. 2904 (2005); *U.S. Telecom Assoc. v. FCC*, 359 F.3d 554 (D.C. Cir. 2004) (reversing major portions of the FCC's *Triennial Order*), *cert. denied*, 125 S.Ct. 313 (2004).

107. *Verizon Comm., Inc. v. Trinko*, 540 U.S. 398 (2004).

subsequent legislation does not give a free pass to companies that violate the laws that protect consumers from anticompetitive practices.

From time to time, communications markets may not be perfectly competitive. As a result, government should be more, not less, concerned to disapprove mergers that lead to excessive concentration. Given the dynamic nature of the industry and the structure of regulation, particular concern should be given to mergers that not only result in a loss of actual competitors, but also result in a loss of potential competitors. For example, cable and telephone companies are competitors today in data services, but they also appear to be likely competitors in voice and video services. Ignoring the potential benefits from future competition would not be wise antitrust policy.

In order to create a much wiser antitrust policy, the FCC and the Department of Justice ("DOJ") every two years should publish a joint analysis of structure, conduct, and performance of communications markets. In this analysis, the FCC should publicly state its goals for the next two years, and the DOJ should outline the sort of mergers it is likely to approve and those it is likely to reject. This is little different from the farsighted policies of Antitrust Division Chief William Baxter, who supervised the breakup of AT&T under President Reagan. An independent commission of bipartisan makeup should critique this analysis within three months thereafter.

VI. CONCLUSION

Congress and the FCC need to set an aggressive path for the near future so that consumers can get the full benefits of the telecommunications revolution. For far too long, the level of action has been reaction and business as usual. With the advent of broadband and promise of wireless, a new vision at the FCC is needed. Revamped pricing rules are needed so that they reflect a true structure of competing networks, not a network of adjacent monopolies. Congress also needs to act. It needs to ensure that the regulatory structure is set in place for a world-class worldwide communications system. This means alleviating all of the jurisdictional infighting that throws sand into the gears of the system and ensuring that the FCC has the mandate and authority to setup the necessary rules. It also requires holding state and local authorities accountable for ensuring that their citizens have access to the physical networks that will provide the on-ramps to the information highway.

Because of the political baggage that has hampered the FCC and Congress from doing an effective job in setting a market-oriented communications policy, the first step should be the appointment of a nonpartisan independent commission. This independent commission should

have a clear charge with a limited time frame. The independent commission's recommendations should form the basis for new laws and FCC rulings that take effect within a very short time from the conclusion of the independent commission's report.

Costs and Consequences of Federal Telecommunications Regulations

Jerry Ellig*

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I. INTRODUCTION

Economic regulation has substantial effects on telecommunications consumers in the United States. Regulation determines which services are priced above cost, which services are priced below cost, and which consumers will be overcharged in order to subsidize others. Regulation also affects which kinds of technologies and services will be offered to consumers and when, and whether consumers can decline to purchase certain services. It even helps determine who is allowed to compete and how.

Telecommunications companies, cable companies, Internet service providers, equipment manufacturers, and various other interest groups spend millions of dollars each year to bend regulations to their liking.

Economists have analyzed the effects of many individual regulations on both consumers and producers. Despite the surfeit of interest group interest and scholarly inquiry, no one has yet undertaken a comprehensive survey of the costs and outcomes of federal telecommunications regulation. This Article seeks to fill that gap by compiling scholars' estimates of the costs and outcomes of these regulations, identifying gaps in knowledge, and in some cases offering original estimates based on established methodologies. The research covered includes studies published in academic journals and books, academic working papers, and Federal Communications Commission ("FCC") reports. It includes studies sponsored by industry or advocacy organizations only when they offer novel information, data unavailable elsewhere, or empirical analysis based on academic work.

The focus here is on federal regulation of telecommunications. Key issues of interest are the effects of regulation on the prices, quantity and quality of service, along with the associated effects on consumer welfare and overall economic welfare. Regulations that primarily affect applications or uses of information that pass through the infrastructure are outside the scope of this study.

As in a number of other regulated industries, the federal government and states split jurisdiction. Traditionally, states have regulated intrastate services, such as local telephone service and intrastate long-distance service. The federal government regulates interstate services, such as interstate long-distance, wireless, and Internet. The 1996 Telecommunications Act redrew these boundaries somewhat. Congress prohibited states from giving local telephone companies exclusive franchises; henceforth, states could no longer create barriers to entry.¹ To stimulate competition, this legislation also requires incumbent local phone companies to lease elements of their networks to competitors and permits competitors to purchase their service at wholesale rates and resell it at retail rates.² The FCC decides which elements and services are subject to these requirements and establishes pricing methodologies. State regulatory commissions, however, determine the actual prices. Most recently, the FCC decided that Internet telephony, or "Voice over Internet Protocol," service is under federal rather than state jurisdiction.³

Part I of this Article outlines the principal effects of regulation predicted by economic theory. Part II explains how the Article classifies

1. 47 U.S.C. § 253(a) (2000).

2. 47 U.S.C. § 251(c)(3)-(4) (2000).

3. See Vonage Holdings Corporation Petition for Declaratory Ruling Concerning an Order from the Minnesota Public Utilities Commission, *Memorandum Opinion and Order*, 19 F.C.C.R. 22404, para. 1 (2004).

costs and outcomes, employing basic concepts from price theory. Part III presents estimates of costs and assessments of outcomes for ten types of federal telecommunications regulatory activity: telecommunications regulatory spending, long-distance access charges, universal service funding, local number portability, enhanced 911, miscellaneous wireless mandates, spectrum management, satellite regulation, unbundled network elements, and resale of the incumbent's services. Part IV outlines the principal conclusions one can draw, given the state of existing research.

II. THE BASICS: EFFECTS OF ECONOMIC REGULATION

Economic theory suggests that price regulation can improve consumer welfare when the regulated firm has monopoly power. If the firm charges a price that exceeds the price it would charge if it faced competition, ideal regulation can mimic the results of competition and force the firm to charge the "competitive" price. When this occurs, regulation has two beneficial effects for consumers. First, consumers who were already buying the service receive it at a lower price; the gains to these consumers can be measured by the amount of the price reduction multiplied by the amount they were already buying at the monopoly price. Second, the lower price induces consumers to purchase more, and this increased consumption further increases consumer welfare. Conceptually, this gain to consumers equals the difference between the regulated price the consumer pays and the price the consumer would have been willing to pay, summed over all of the additional units that are consumed.⁴

The Telecommunications Act of 1996 assumes that competition is possible and desirable in all markets. In some cases, it directs the FCC to promulgate regulations that are intended to move the industry from monopoly to competition, rather than substitute regulation for competition. To the extent that such regulations accomplish this goal, they should have a similar effect on consumers as ideal regulation, reducing price and increasing the amount of service purchased. In addition, the move from monopoly to competition could produce other consumer benefits that regulation rarely delivers, such as innovative new services.

Some regulations mandate that firms must offer, and consumers must pay for, particular services or network functionalities. Examples include 911 emergency service and local number portability. Such mandates may be intended to remedy market failures, such as public good problems or market power. Alternatively, they may simply be adopted because lawmakers and regulators believe they are good things that consumers

4. See N. GREGORY MANKIW, *PRINCIPLES OF MICROECONOMICS* 293-346 (2d Can. ed. 2001) (discussing a monopolistic scenario versus one of perfect competition).

should have, even if there is no market failure.

Regulation is intended to make consumers better off by producing a price equal to the competitive market price or by correcting for other market failures.⁵ However, there is no guarantee that this will occur in practice. There are at least five reasons: (1) prices below competitive market levels can create shortages; (2) regulation can hold prices above costs; (3) regulation and monopoly inflate costs; (4) regulation stifles innovation and entrepreneurship; and (5) expenditures to acquire and maintain wealth transfers increase costs.

A. *Below Competitive Prices*

If regulators set prices below the competitive level, they create shortages. History suggests that regulators frequently succumb to this temptation.⁶ The temptation is especially strong in capital-intensive industries that require high up-front investments that have few good alternative uses. After the investment is made, public policy can reduce prices below the competitive level without immediately creating a shortage, as long as the price is high enough to cover the firm's ongoing costs of operation. Such prices harm consumers in the long run because firms will refrain from investing if they expect the unremunerative prices to continue. Eventually, this reduction in investment creates shortages, deteriorations in the quality of service, or other problems that diminish consumer welfare.

5. For the sake of simplicity, this Article defines "competitive" price the same way as most introductory economics textbooks do: as a single price charged by a firm whose behavior is constrained by the presence of competitors. We must assume that a competitive firm is already efficient, or else it would already have been displaced by competitors. We must also assume that the competition is sufficiently strong that the firm cannot unilaterally raise prices or earn profits that exceed its cost of capital. In an industry such as telecommunications, which is undergoing rapid technological change, there are several reasons why the concept of "competitive" price is more complicated. First, technological improvements normally cause prices to fall over time; thus, it is more accurate to speak of a competitive price path rather than a single competitive price. The more rapid the pace of innovation, the more rapidly prices fall; but the more rapidly prices fall, the higher they must be initially if firms expect to recoup their investments before competitors imitate or out-innovate them. Second, diverse consumer wants can lead to product differentiation; in such situations, the "competitive" price is actually a set of prices for different products and services that are not perfect substitutes. Third, the possibility of innovation creates substantial uncertainty as to how much consumers are willing to pay for a service, and for how long. This uncertainty requires a higher level of profit to elicit investment than would be required in the absence of uncertainty. For these reasons, "the competitive price" of a telecommunications service or facility is likely to be a range of price paths that differ from the price observed in a relatively stable, regulated market. To keep the language simple, though, this study will continue to use the term "competitive price" to refer to this more complicated, dynamic collection of prices.

6. See ROBERT W. CRANDALL & LEONARD WAVERMAN, WHO PAYS FOR UNIVERSAL SERVICE?: WHEN TELEPHONE SUBSIDIES BECOME TRANSPARENT 112 (2000).

B. Above Competitive Prices

Price and entry regulation imposed on a competitive industry can actually increase prices and reduce consumption. This can occur either because policymakers imposed regulation on a competitive industry mistakenly or because they consciously did so in response to political incentives.

Political incentives to regulate a competitive industry could come from the industry itself, which may seek regulation in order to forestall competition and increase profits. But political pressures may also come from certain segments of customers, who use regulation to obtain service at subsidized rates with the subsidies funded through excessive charges imposed on other consumers. The history of telecommunications, as well as the actual structure of telecommunications regulation, suggests that policymakers have responded to both types of political pressures. Traditionally, telecommunications regulation created market power, then mandated that some of the monopoly overcharges must be used to make local residential phone service available at prices that failed to cover incremental costs. Mandated services and functionalities may also contain an element of cross-subsidy. All consumers must purchase these services, and consumers for whom the cost exceeds the value might subsidize those for whom the value exceeds the cost. Regulation thus becomes an opaque way of taxing some services to fund a highly visible "free lunch."⁷

When regulation elevates prices above costs, it reduces consumer welfare both by increasing price and by reducing output. Cross-subsidies can reduce producer welfare as well. If a monopolist is allowed to overcharge and use the money to fund cross-subsidies, the firm sacrifices some or all of the inflated profits. If regulators force competing firms to overcharge consumers and then hand the money to some other firm to subsidize its service, the firms forced to collect the excess charges will see their sales and profits fall in response to the mandated price increase. This latter example may appear fanciful in the abstract, but it happens quite frequently in telecommunications regulation, as we shall see.

C. Inflated Costs

Cost-of-service regulation often distorts the regulated firm's choice of inputs, so the regulated firm fails to produce at minimum cost. The resulting rates might be considered "just and reasonable" because they

7. See Richard A. Posner, *Taxation by Regulation*, 2 BELL J. ECON. 22, 28 (1971). For empirical research, see generally CRANDALL & WAVERMAN, *supra* note 6; ROBERT W. CRANDALL, *AFTER THE BREAKUP: U.S. TELECOMMUNICATIONS IN A MORE COMPETITIVE ERA* (1991).

reflect costs, but the costs themselves are inflated.⁸ Competition creates pressure for firms to squeeze out unnecessary costs and provide a combination of price and quality that consumers prefer. Where monopoly is expected to persist, both federal and state telecommunications regulators have increasingly opted for “price cap” regulation, which caps the prices firms can charge but allows them to earn additional profits by cutting costs. Price caps can thus help avoid the cost-increasing incentives associated with cost-of-service regulation.

D. *Stifled Innovation and Entrepreneurship*

Empirical studies frequently find that economic deregulation generates larger price reductions and consumer benefits than economists predicted based on pre-deregulation costs and market conditions.⁹ Such findings underscore the importance of innovation and entrepreneurship in improving economic welfare. As Winston noted, “Predictions of the effects of deregulation were generally guided by static models that assumed technology and operations would not be significantly affected by the change in the regulatory regime.”¹⁰ Regulation diminishes entrepreneurial incentives to lower costs, improve quality, and develop new products and services.

Regulatory constraints on profits reduce the rewards for risky, but potentially valuable, innovation. In theory, regulators could prevent this problem by permitting the firm to earn a sufficient risk premium. In practice, regulators face a continual temptation to disallow the risk premium once an innovation is introduced and proven successful because the successful innovation will likely remain in place even if regulation

8. See generally E. Ray Canterbury et al., *Cost Savings from Nuclear Regulatory Reform: An Econometric Model*, 62 S. ECON. J. 554 (1996) (explaining how poor management or faulty execution can lead to excess costs in the construction of power plants); Leon Courville, *Regulation and Efficiency in the Electric Utility Industry*, 5 BELL J. ECON. 53 (1974) (assessing the impact of the Averch-Johnson effect as a factor in causing companies to engage in inefficient behavior); Paul M. Hayashi & John M. Trapani, *Rate of Return Regulation and the Regulated Firm's Choice of Capital-Labor Ratio: Further Empirical Evidence on the Averch-Johnson Model*, 42 S. ECON. J. 384 (1976) (describing the effects of the Averch-Johnson model in increasing costs); H. Craig Petersen, *An Empirical Test of Regulatory Effects*, 6 BELL J. ECON. 111 (1975) (providing additional evidence proving the Averch-Johnson effect); Robert M. Spann, *Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis*, 5 BELL J. ECON. 38 (1974) (confirming the Averch-Johnson effect).

9. See Jerry Ellig, *Railroad Deregulation and Consumer Welfare*, 21 J. REG. ECON. 143, 164–65 (2002). See also Clifford Winston, *U.S. Industry Adjustment to Economic Deregulation*, 12 J. ECON. PERSPECTIVES 89, 91 (1998); Clifford Winston, *Economic Deregulation: Days of Reckoning for Microeconomists*, 31 J. ECON. LIT. 1263, 1285–86 (1993).

10. Winston (1998), *supra* note 9, at 91.

reduces its profitability. After the fact, it is often difficult to distinguish between high profits resulting from innovation and high profits resulting from market power. Expropriating these profits, however, reduces incentives for future innovation. And if profit regulation removes the carrot, protected markets remove the stick—the competitive threat that could otherwise spur entrepreneurship.¹¹

In addition to altering incentives for discovery, economic regulation short-circuits the market's normal trial and error process. Real-world competition is a dynamic process of trial and error. The purpose of competition is to reveal what services, costs, and prices are possible.¹² In his dissent in *AT&T v. Iowa Utilities Board*, a key case interpreting the Telecommunications Act of 1996, Justice Breyer noted:

The competition that the Act seeks is a process, not an end result; and a regulatory system that imposes through administrative mandate a set of prices that tries to mimic those that competition would have set does not thereby become any the less a regulatory process, nor any the more a competitive one.¹³

If there is no competitive market, actual competitive prices cannot be observed, but public policy regularly assumes that regulators can estimate prices tolerably close to those that a competitive market would have generated if it existed. In the absence of competition, we do not know for sure what services, costs, and prices are possible; to estimate what competitive prices would be, these things must be assumed, and the assumptions may be wrong. In a very static industry, historical costs may be a useful guide for calculating “competitive” prices. In a dynamic industry, though, attempts to estimate competitive prices that do not actually exist will be fraught with error.

Regulation can also stifle innovation more directly when firms must obtain regulators' permission before entering new markets or offering new services. In some cases, firms must wait for regulators to establish the legal or institutional framework before they can deploy a new technology.¹⁴ The ten-year delay in allowing local Bell telephone companies to offer voicemail, for example, cost consumers approximately \$1.27 billion annually, and regulation-induced delay in the introduction of cell phone

11. See Israel M. Kirzner, *The Perils of Regulation: A Market Process Approach*, in *DISCOVERY AND THE CAPITALIST PROCESS* 119 (1985).

12. See F. A. Hayek, *Competition as a Discovery Procedure*, in *NEW STUDIES IN PHILOSOPHY, POLITICS, ECONOMICS AND THE HISTORY OF IDEAS* 179 (1978).

13. 525 U.S. 366, 424 (1999) (Breyer, J., concurring in part and dissenting in part).

14. See Robert Crandall & Jerry Ellig, *Economic Deregulation and Customer Choice: Lessons for the Electric Industry* (1997), <http://mercatus.org/pdf/materials/839.pdf> (giving examples from various industries).

service cost consumers \$50 billion annually in forgone benefits.¹⁵

E. Expenditures to Acquire or Maintain Wealth Transfers

Whether it curbs or creates market power, regulation transfers wealth. The fact that regulation is a means of transferring wealth also implies another effect on the welfare of both consumers and the regulated industry. When wealth transfers are available, organized interests will expend resources to obtain them. Regulated firms will spend money to retain monopoly profits, or to protect themselves from below-competitive prices that expropriate their assets. From a society-wide perspective, money spent solely to capture wealth transfers is often considered pure waste. In some circumstances, the total amount of money wasted may even exceed the size of the wealth transfer.¹⁶

III. CLASSIFYING REGULATORY COSTS AND REGULATORY OUTCOMES

Ideal economic regulation benefits consumers by reducing prices to competitive levels or correcting for other market failures. In reality, economic regulation may harm consumers by holding prices below competitive levels, raising prices above competitive levels, increasing costs, reducing innovation, or turning wealth transfers into social waste. Identifying which of these things have occurred in practice is the key to assessing the costs and consequences of economic regulation.

In practice, it is often easier to identify price changes and their consequent effects than to identify forgone opportunities to cut costs or introduce new innovations. Much of the empirical economics literature on telecommunications regulation takes this approach. The virtue of this approach is that it offers a simple and powerful framework for understanding the effects of regulation. The principal drawback is that it likely understates the costs of regulation. Nevertheless, the measured costs are substantial.

15. See Jerry A. Hausman, *Valuing the Effect of Regulation on New Services in Telecommunications*, in 1997 BROOKINGS PAPERS ON ECONOMIC ACTIVITY. MICROECONOMICS 2 (Martin N. Baily et al. eds., 1998), available at http://econ-www.mit.edu/faculty/download_pdf.php?id=470.

16. See Michael A. Crew & Charles K. Rowley, *Toward a Public Choice Theory of Monopoly Regulation*, 57 PUBLIC CHOICE 49 (1988); Gordon Tullock, *The Welfare Costs of Tariffs, Monopolies, and Theft*, in TOWARD A THEORY OF THE RENT-SEEKING SOCIETY 39 (James Buchanan et al. eds., 1980).

A. *Costs*

This Article classifies regulatory costs into several categories based on elementary price theory:

Wealth transfers: Economic regulation redistributes wealth from some consumers and producers to other consumers and producers. Traditionally, economic researchers have not regarded such transfers as a cost of regulation, because one party's loss is another party's gain. However, if the transfer process itself is wasteful, or if firms expend resources to capture or defend themselves from wealth transfers, then some or all of the transfer is a cost. The size of the wealth transfer is equal to the price change induced by regulation times the number of units of output sold under regulation, or $p \cdot Q$.

Forgone consumer surplus: When regulation raises costs or prices, consumers use less of the regulated service, and they are worse off as a result. The value that consumers forgo, minus the price they would have paid, is the forgone consumer surplus. The change in consumer welfare is approximately equal to one-half of the change in price induced by regulation times the change in quantity induced by the price change, or $.5 \cdot \Delta p \cdot \Delta q$.¹⁷

Total cost to consumers: This is the sum of the wealth transfer extracted from consumers plus the forgone consumer surplus, or $p \cdot Q + .5 \cdot \Delta p \cdot \Delta q$. If some of the wealth is redistributed to consumers, it is counted as a beneficial outcome, and estimating the net effect on consumers requires a comparison of the total cost to consumers with the value of any wealth transfers or other benefits that consumers receive.

Forgone producer surplus: When prices inflated by regulation prompt consumers to use less of a service, producers sell less of it. The profits they lose on the sales they do not make is called forgone producer surplus. Forgone producer surplus is approximately equal to the change in quantity induced by the regulation times the difference between the price that would exist in the absence of the regulation minus the marginal cost, or $\Delta q \cdot (p - m)$.¹⁸

Value of forgone output: This is the sum of forgone consumer surplus and forgone producer surplus that occurs when regulation reduces consumption by raising prices. Mathematically, it is equal to $.5 \cdot \Delta p \cdot \Delta q +$

17. See Jerry Hausman & Howard Shelanski, *Economic Welfare and Telecommunications Regulation: The E-Rate Policy for Universal-Service Subsidies*, 16 YALE J. ON REG. 19, 40 (1999).

18. *Id.*

$\Delta q \cdot (p-m)$. Empirical studies frequently calculate this total sum rather than breaking it up into the consumer and producer surplus components. The value of forgone output is also called the “excess burden” of the regulation.

Wealth transfer plus forgone output: This is the widest measure of the cost of regulation, equal to $p \cdot Q + .5 \cdot \Delta p \cdot \Delta q + \Delta q \cdot (p-m)$. It truly counts as a measure of social cost if all of the wealth transfer is wasted. To the extent that the wealth transfer is not wasted, adding the wealth transfer to the forgone output overstates the cost of regulation.

The trickiest aspect of these calculations, aside from actually getting the relevant data, is ascertaining how much of a change in quantity occurs as a result of a regulation-induced price change. The change in quantity can be calculated from the change in price with the aid of an estimate of the price elasticity of demand. The price elasticity of demand measures how responsive quantity is to price. It is equal to the percentage change in quantity divided by the percentage change in price. The elasticity of demand is defined as $(\Delta q/q)/(\Delta p/p)$.¹⁹ If one has an estimate of the elasticity and also the values of p , Δp , and q , then one can solve for Δq .

All of the cost estimates in this Article are derived from these simple mathematical relationships. In some cases, data or estimates of p , q , Δp , and elasticities of demand were readily available from published studies or FCC reports. In other cases, studies report only a figure for forgone consumer surplus or total cost to consumers, but combining these study results with data on other variables of interest allows one to calculate the missing figures.

In some cases, the costs estimated in this Article emerge simply because regulators set prices above or below competitive levels. In other cases, wealth transfers and forgone consumer and producer surplus occur because of regulation’s more complicated effects on cost levels, innovation, and entrepreneurship. The particular factors that underlie estimates of regulatory costs will vary depending on the service studied, the nature of the regulation, and the analytical method chosen by the authors of a particular study.

Federal telecommunications regulations have significant costs, as Table 2 on page 98, *infra*, shows. These regulations cost consumers at least \$25 billion annually in forgone consumer surplus, or as much as \$100 billion if one includes the wealth transfers as a cost to consumers. Total deadweight loss is approximately \$41.7 billion annually. If all of the wealth transfer is counted as a cost, the total social cost is approximately \$118 billion annually. The figures fall only slightly if FCC regulatory

19. Lecture 4—Price Elasticity of Demand, DIGITAL ECONOMIST, Dec. 16, 2002, http://www.digitaleconomist.com/DE_micro_4.pdf.

expenditures are subtracted from the totals.

B. *Outcomes*

This study explicitly focuses on policy outcomes, rather than the more common discussion of economic “benefits.” Regulatory outcomes may be positive or negative; all benefits are outcomes, but not all outcomes are beneficial. It is much less awkward to speak of “outcomes,” positive or negative, than to use phrases like “negative benefits” or “dis-benefits.”

The reason for focusing on outcomes is that some outcomes of great interest to policymakers may not fit the economist’s definition of benefits. One goal of universal service programs, for example, may be to redistribute wealth from the rich to the poor by subsidizing telephone service for the poor. In conventional cost-benefit calculations, the wealth transfer would not count as a benefit because one person’s loss is another person’s gain. Nevertheless, policymakers may be quite interested in knowing how effectively universal service programs accomplish the goal of progressive wealth redistribution. Economic research can shed significant light on this question. A focus on outcomes, rather than a narrower focus on benefits, thus permits inclusion of a broader range of information about policy results that economic research illuminates.

The key FCC document that identifies and assesses outcomes is its annual *Performance and Accountability Report*.²⁰ The *Report* articulates the outcomes the FCC seeks to accomplish, and it also contains data on outcome trends. The FCC has six strategic goals: broadband, competition, spectrum, media, homeland security, and modernization. The first three of these goals involve outcomes produced by FCC regulation of telecommunications and the Internet. The fourth goal, homeland security, involves several activities that affect the cost of telephone service, such as deployment of Enhanced-911 and compliance with the Communications Assistance to Law Enforcement Act (“CALEA”).

For each strategic goal, the FCC lists performance goals, outcome indicators, and performance measures. Virtually all of the performance measures are FCC activities and outputs that are assumed to contribute to accomplishment of the performance goals. Many of the performance goals and outcome indicators articulate outcomes the FCC strives to produce for citizens. Table 2 lists only those performance goals and outcome indicators that identify actual outcomes of domestic U.S. telecommunications regulation.

For each outcome indicator, the *Report* provides numerical data

20. FCC, *Fiscal Year 2004 Performance and Accountability Report* 115 (2004), available at <http://www.fcc.gov/Reports/ar2004.pdf> [hereinafter *Report*].

showing trends and progress. The accompanying narrative often mentions specific regulatory initiatives that the FCC believes contributed to the outcomes. However, there is little actual proof in the *Report* that the FCC actions caused the measured outcomes, and no estimate of how much of each outcome could be attributed to the FCC's actions.²¹

Scholarly researchers have also assessed the outcomes of some FCC regulations. The discussion of regulatory outcomes in this study presents the results of such research, as well as relevant outcome information from the FCC's *Report*.

21. In fairness, we should note that the FCC's *Report* is produced for a somewhat different purpose than this study. The FCC's *Report* is intended to assess outcomes of all of the FCC's major activities; it thus focuses on what the FCC has accomplished. In a number of cases, such as spectrum auctions and reductions in long-distance access charges, market-based modernization of the FCC's regulatory approach has generated significant benefits for consumers and society. A comparison of the FCC's current approach with its approach ten or twenty years ago would show significant improvement, and this improvement is reflected in some of the favorable trends reported in the report. Conversely, this Article examines the costs and outcomes of specific remaining FCC regulations. It thus focuses on opportunities for improvement, rather than what the FCC has already accomplished. As a result, its tone is necessarily more critical than the report.

TABLE 1

**FCC 2004 DOMESTIC OUTCOME-ORIENTED GOALS AND INDICATORS RELEVANT TO
TELECOMMUNICATIONS REGULATION²²**

Broadband◆ *Performance Goal*

- Broaden the deployment of technologies across the United States and globally.

◆ *Outcome Indicators*

- Increase access to broadband services;
- Increase access to broadband services and devices across multiple platforms: DSL, cable modem, satellite, terrestrial wireless, etc.; and,
- Increase number of types of unlicensed and licensed wireless broadband devices.

Competition◆ *Performance Goals*

- Ensure American consumers can choose among multiple reliable and affordable means of communications; and,
- Ensure that all American consumers have and retain wireless and wireline phone services.

◆ *Outcome Indicators*

- Increase percentage of households with competing providers for multichannel video programming and information services;
- Increase numbers of consumers and businesses having a choice among wireless and wireline service providers; and,
- Lower relative price for wireless and wireline services.

Spectrum◆ *Performance Goals*

- Ensure that spectrum is used efficiently and effectively;
- Facilitate domestic and international deployment of new spectrum-based technologies and services; and,
- Promote ease of access to spectrum by more users.

◆ *Outcome Indicators*

- Increase number of approvals for enhanced telecommunications equipment; and,
- Facilitate deployment of new or existing services or devices that make efficient use of spectrum.

Homeland Security◆ *Outcome Indicator*

- Increase deployment of Enhanced-911.

22. This list includes only those items that clearly focus on outcomes. For a complete list, see *Report, supra* note 20.

IV. ANALYSIS OF COSTS AND OUTCOMES

A. *Regulatory Expenditures*

In theory, the easiest cost of regulation to identify is the money spent to run the FCC. FCC outlays totaled \$351 million in fiscal year 2003 and are estimated at \$361 million for fiscal year 2004.²³

In addition to the direct cost to taxpayers, these expenditures create an indirect cost: the reduction in economic output that occurs because of the taxes necessary to raise the revenues. The value that this lost output would have created for consumers and producers is called the “excess burden” of the tax. Economic research suggests that general taxation usually involves an excess burden of \$0.25–\$0.40 per dollar raised.²⁴ Multiplying \$0.25–\$0.40 by \$361 million in FCC outlays for fiscal year 2004 yields an excess burden of approximately \$90–144 million. Adding the excess burden to the outlays results in a total cost of \$451–505 million; the higher figure appears in the “excess burden” column of Table 2. FCC outlays, which reflect appropriations, may either over- or understate the FCC’s expenditures on telecommunications and broadband regulation. The FCC’s appropriation covers other regulatory initiatives, such as broadcasting, that are outside the scope of this study. On the other hand, the FCC receives revenues from the public in addition to appropriations, such as revenues from spectrum license auctions, interest on loans to spectrum buyers, penalties, and forfeitures. It retains some of these revenues to cover its costs.

The *Report* provides an alternative estimate of federal expenditures on the regulations covered in this study. The *Report* breaks costs down by strategic goal. The first three strategic goals—broadband, competition, and spectrum—cover most of the regulations in this study. The combined net cost of these three programs is approximately \$1.2 billion.²⁵ Obviously, not all of this is financed by appropriations. If the excess burden associated with the non-appropriated funds is also \$0.25–\$0.40 per dollar raised, then the total excess burden is \$300–480 million.²⁶ Total spending of \$1.2 billion plus the excess burden would be \$1.5–1.7 billion.²⁷ These are big

23. See SUSAN DUDLEY & MELINDA WARREN, MERCATUS CTR. & WEIDENBAUM CTR., REGULATORS’ BUDGET CONTINUES TO RISE: AN ANALYSIS OF THE U.S. BUDGET FOR FISCAL YEARS 2004 and 2005 740 (2004), <http://www.mercatus.org/pdf/materials/796.pdf>.

24. See Jerry Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, 53 NAT’L TAX J. 733, 739 (2000).

25. *Report*, *supra* note 20, at 115. This figure excludes revenues and costs for the Universal Service Fund, which are addressed separately, *infra*, Part IV.D.

26. The \$300 million and \$480 million figures are derived by multiplying \$1.2 billion times \$0.25 and \$0.40, respectively.

27. The \$1.5 billion and \$1.7 billion figures are derived when \$300 million and \$480

numbers, but the costs that flow from FCC regulations far exceed the FCC's expenditures.

B. *Long-Distance Access Charges*

Long-distance telephone companies pay access charges to local telephone companies. There is virtually unanimous agreement among regulatory economists that, historically, these charges have been used to subsidize local telephone service.²⁸ Long-distance access charges are but one example of the patchwork of charges that various carriers pay each other when they exchange traffic. For interstate calls, these charges average \$0.01–\$0.051 per minute, depending on the carriers. The FCC has an ongoing proceeding that seeks to rationalize and simplify these charges.²⁹ Many of these charges distort prices and generate costs for consumers. The only one whose costs have been studied extensively, however, is long-distance access charges. Cost figures for long-distance access charges should, therefore, be taken as a lower-bound estimate of the costs generated by the current intercarrier compensation arrangements.

1. Costs

A large body of empirical research estimates the effect of access charges on consumer welfare by examining their effect on long-distance prices and usage. Because consumer demand for long-distance service is very responsive to price, access charge policies that inflate the price of long-distance service generate significant reductions in consumer welfare. When an artificial price increase leads consumers to cut back on consumption by a large amount, it makes consumers substantially worse off. Most studies find that the price elasticity of demand for long-distance service is relatively large, in a range between -0.05 and -0.72; a 1% increase in long-distance prices reduces use by about one-half to three-

million are added to \$1.2 billion, respectively.

28. See Wayne Leighton, *Consumers and Cross-Subsidies: An Interest Group Theory of Telecommunications Regulation 67–69* (1996) (unpublished Ph.D. dissertation, George Mason University) (on file with the Author and the *Federal Communications Law Journal*). The argument that long-distance service does not cross-subsidize local service is based on the assumption that local loop costs are “common costs” of producing long-distance and local service. However, the fact that customers might use local phone lines for both local and long-distance calls does not mean that local loops are common costs for the phone companies. A loop provides a customer with access to the telecommunications network. The cost of any loop is incremental to the rest of the system, and a loop receives a subsidy if it does not cover its incremental costs. See, e.g., Steve G. Parsons, *Cross-Subsidization in Telecommunications*, 13 J. REG. ECON. 157, 169–70 (1998).

29. See *Developing a Unified Intercarrier Compensation Regime, Further Notice of Proposed Rulemaking*, 20 F.C.C.R. 4685 (2005).

quarters of 1%.³⁰ A consensus estimate of the elasticity is -0.07.³¹ Hence, long-distance access charges generate relatively large reductions in long-distance usage and consumer welfare.

The most recent and extensive study that measures these welfare impacts was published by the Brookings Institution in 2000. Using 1996 data, Crandall and Waverman first employed several different cost models to estimate how much additional revenue local phone companies would earn if they could eliminate cross-subsidies and price local phone service at incremental cost.³² They then estimated the effect on long-distance prices and economic welfare if these additional revenues were used to reduce long-distance access charges.³³ Depending on the specific model and assumptions, elimination of cross-subsidies increases consumer welfare by between \$1–3.7 billion annually.³⁴ Long-distance companies gain an additional \$1.6–3.4 billion annually, yielding a total increase in economic welfare of between \$2.5–7 billion.³⁵ These estimates are consistent with findings from earlier studies, conducted when access charges were much higher, that showed repricing could increase economic welfare by \$10–17 billion.³⁶ The figures are net calculations that include changes in welfare due to the price increases for local service.

These figures possibly overstate the current cost of interstate access charges for three reasons. First, they are based on data from 1996, when interstate access charges were higher, and monthly subscriber line charges were lower, than they are today. Second, they likely include the effects of reducing intrastate as well as interstate access charges. The estimates assume that local service is priced at cost, and the resulting revenues are used to reduce both interstate and intrastate access charges. Finally, the resulting revenues in some cases exceeded actual access charges.³⁷ This last result probably occurred because local telephone service receives cross-subsidies from other sources in addition to access charges. However, a

30. See Hausman & Shelanski, *supra* note 17, at 36–37.

31. See M. H. Riordan, *Universal Residential Telephone Service*, in 1 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 436 (M. Caves et al. eds., 2002).

32. See CRANDALL & WAVERMAN, *supra* note 6, at 109–12.

33. *Id.* at 113–15.

34. *Id.* at 120. Range of figures is derived by subtracting Crandall and Waverman's estimates of the effect of repricing on long-distance companies' producer surplus from the net effect on economic welfare.

35. *Id.* at tbls. 6–8.

36. See *id.* at 141. This range of figures results when one converts Crandall's 1988 estimate, as well as other estimates he cites for 1983 and 1985, into 1996 dollars (using the Consumer Price Index) to make them comparable with the 1996 estimates in Crandall and Waverman, *supra* note 7.

37. See *id.* at 113–15.

rough calculation using national average data from 1996 suggests that elimination of interstate long-distance access charges would increase consumer welfare, on net, by approximately \$1.9 billion and increase producer welfare by \$3.2 billion.³⁸ These results suggest that inefficiencies associated with interstate access charges are responsible for the bulk of Crandall and Waverman's findings.

A similar rough estimate can be calculated using national average data for 2002, the most recent year for which data are available. Interstate access charges averaged between \$0.01–\$0.016 per domestic conversation minute and generated approximately \$3.3 billion in revenues.³⁹ In 2002, there were 333.8 billion domestic conversation minutes, and average revenue per minute was \$0.07.⁴⁰ The incremental cost of access is measured in tenths of a cent, so most of the access charge subsidizes local telephone service.⁴¹ A \$0.01 interstate access charge reduces consumer welfare by approximately \$300 million and reduces producer welfare by about \$1.2 billion.⁴²

2. Outcomes

The current system of access charges is intended to promote universal service. The assumed public benefit is that more people subscribe to local phone service because access charge revenues subsidize monthly local rates. This outcome could be read as part of the FCC's competition performance goals that focus on ensuring that all American consumers have and retain phone service, and that all Americans have "affordable" means of communications.

These outcomes may address a "market failure," reflecting the internalization of a genuine externality, under three conditions: (1) the value of telephone service to each subscriber rises when other subscribers

38. For calculation method, see *infra* note 293. For data source, see JIM LANDE & KENNETH LYNCH, FCC INDUS. ANALYSIS & TECH. DIV., TELECOMMUNICATIONS INDUSTRY REVENUES 2002 30–31 tbl.10 (2004), available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/telrev02.pdf. Using 1996 data, average revenues per interstate domestic conversation minute (p) were \$0.12, access costs plus universal service contributions per average conversation minute were \$0.049, and interstate domestic conversation minutes totaled 286.8 billion. *Id.*

39. See *id.* (reporting that in 2002, interstate access charges per domestic conversation minute averaged \$0.01, and access charges per interstate 2-ended minute averaged \$0.016).

40. *Id.*

41. See, e.g., Billy Jack Gregg, *A Survey of Unbundled Network Element Prices in the United States*, THE NAT'L REG. RES. INST. tbl. 2 (July 2003) (showing in column G of Table 2A that cost-based unbundled network element switching rates are usually in tenths of a cent per minute).

42. For calculation method, see *infra* note 293. For data sources, see LANDE & LYNCH, *supra* note 38.

join the network, (2) the increase in value is large enough that current subscribers would be willing to subsidize these new subscribers, and (3) individuals fail to take this increased value into account when they decide whether to subscribe.⁴³

Even if these conditions hold, a regulatory response may not be necessary because the owner of the network has strong financial incentives to maximize the value of the network by crafting subsidies to new subscribers if subsidies are needed to internalize the externality.⁴⁴ Alternatively, policymakers may believe that an increase in telephone subscription rates is a good outcome even if there is no externality.⁴⁵

Regardless of whether an externality exists, most research suggests that cross-subsidies from long-distance to local service generate little increase in telephone subscriptions. Consumer decisions to subscribe to telephone service are not very sensitive to the fixed monthly charge.⁴⁶ In other words, local service has a relatively low price elasticity of demand. This elasticity appears to have fallen over time. Several recent studies using census data, for example, have found that the elasticity in 1990 was about one-third of the value in 1970, and in 2000 it was only one-eighth of the 1970 value.⁴⁷ It may even be equal to zero in the United States and other developed countries.⁴⁸ Surveying the findings of multiple studies, Jerry Hausman and Howard Shelanski note:

A comparison of price elasticities of demand for local and long-distance telephone services thus reveals that an increase in long-

43. The first condition defines the existence of an externality. The second condition determines whether it is a "Pareto-relevant marginal externality," an often-overlooked precondition for a subsidy or regulatory action to improve consumer welfare. The third condition is the familiar "external effect," which is not by itself sufficient to justify government intervention. See A.H. Barnett & David L. Kaserman, *The Simple Welfare Economics of Network Externalities and the Uneasy Case for Subscribership Subsidies*, 13 J. REG. ECON. 245, 245–46 (1998).

44. See Stanley J. Liebowitz & Stephen E. Margolis, *Network Effects*, in 1 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 94 (M. Caves et al. eds., 2002).

45. See John C. Panzar, *A Methodology for Measuring the Costs of Universal Service Obligations*, 12 INFO. ECON. & POL'Y 211, 213 (2000).

46. See Barnett & Kaserman, *supra* note 43, at 252–53; Riordan, *supra* note 31, at 431; David L. Kaserman et al., *Cross-Subsidization in Telecommunications: Beyond the Universal Service Fairy Tale*, 2 J. REG. ECON. 231 (1990).

47. See Christopher Garbacz & Herbert G. Thompson, *Estimating Telephone Demand with State Decennial Census Data from 1970–1990*, 21 J. REG. ECON. 317, 326 (2002) [hereinafter Garbacz & Thompson (2002)]; Christopher Garbacz & Herbert G. Thompson, *Estimating Telephone Demand with State Decennial Census Data from 1970–1990: Update with 2000 Data*, 24 J. REG. ECON. 373, 376 (2003) [hereinafter Garbacz & Thompson (2003)].

48. See CRANDALL & WAVERMAN, *supra* note 6, at 91; Christopher Garbacz & Herbert G. Thompson, *Universal Telecommunication Services: A World Perspective*, INFO. ECON. & POL'Y 495, 497, 506 (2005) [hereinafter Garbacz & Thompson (2005)].

distance prices is probably more harmful to society's economic welfare than is an increase in local service prices. Long-distance demand, with a price elasticity of -0.7, will contract substantially more in the face of a price increase than will local-service demand, with a price elasticity of -0.005.⁴⁹

These differing elasticities suggest that cross-subsidies from long-distance to local service may at best generate small increases in telephone subscription at the cost of a large reduction in consumer welfare due to inflated long-distance prices.

Yet even this tradeoff may be an illusion. Higher long-distance rates tend to reduce telephone subscription since consumers subscribe to local phone service in part so that they can make long-distance calls. Some studies find that subscription is more sensitive to changes in long-distance rates than to changes in local rates.⁵⁰ Therefore, a reduction in the cross-subsidy from long-distance to local rates may actually increase telephone penetration. The principal study examining these offsetting effects estimated that the reduction in cross-subsidies that the FCC ordered between 1984 and 1990 actually increased telephone penetration rates by 0.45%, bringing 450,000 additional households onto the telephone network.⁵¹

More recent studies using a variety of statistical techniques find very little evidence that the cost of monthly service affects telephone penetration rates, even for low-income households; in that case, access charges generate consumer costs but simply fail to promote universal service.⁵² In short, the policy of cross-subsidizing local rates with revenues from long-distance access charges generates little increase in telephone subscription rates, and may even reduce them.

The principal indicator the FCC's *Report* cites as relevant to "affordability" of telephone service is a 4% decline in the Consumer Price Index for telephone services between 1998 and 2004.⁵³ However, this index includes long-distance and wireless service, as well as the local service that gets subsidized in the name of "affordability." Clearly, telephone service

49. Hausman & Shelanski, *supra* note 17, at 39.

50. See Jerry Hausman et al., *The Effects of the Breakup of AT&T on Telephone Penetration Rates in the United States*, 83 AM. ECON. REV. 178, 182-83 (1993).

51. *Id.* Garbacz and Thompson also find that higher long-distance prices reduce telephone penetration rates, and the size of the effect falls between 1970 and 2000. This is a logical finding, given the large reductions in long-distance prices that occurred over that period. Garbacz & Thompson (2002), *supra* note 47; Garbacz & Thompson (2003), *supra* note 47.

52. See CRANDALL & WAVERMAN, *supra* note 6, at 94-104. See generally Garbacz & Thompson (2005), *supra* note 48.

53. *Report*, *supra* note 20, at 33.

has become more affordable. However, it is doubtful that access charges have done anything to make telephone service more affordable. If anything, it is the FCC's efforts to reduce access charges that have reduced the per-minute cost of telephone service by enabling large reductions in long-distance rates that spurred increased usage.

Another potential goal of the cross-subsidy may be to redistribute income via the phone lines. The evidence suggests that the cross-subsidy is difficult to justify on equity grounds. Even in households with incomes of less than \$10,000, long distance accounts for more than 40% of average monthly telephone expenditures.⁵⁴ In all income classes, long-distance usage is quite variable, with some households using a lot and some very little.⁵⁵ It is thus safe to say that many low-income households use a great deal of long-distance service; consequently, the cross-subsidy may actually diminish the welfare of these households.⁵⁶ In addition, the local service subsidy funded with access charges is not targeted based on income, in marked contrast to the practice in other regulated utilities such as electricity and natural gas. Rich and poor households alike are entitled to one cheap residential phone line—an odd way of redistributing income to the poor.⁵⁷

Crandall and Waverman's study found that cross-subsidies from long-distance to local service transfer only \$2 per month to low-income households on average. Put differently, the nation forgoes \$2.5–7 billion in order to redistribute about \$435 million to low-income households.⁵⁸ The authors note, "Regardless of the assumed cost model, this is a very costly income redistribution policy."⁵⁹

C. Universal Service Funding

In addition to authorizing access charges on some carriers, FCC regulations require universal service "contributions" from providers of interstate and international telecommunications services to subsidize basic phone service for low-income customers, subsidize high-cost phone companies, provide reduced-price Internet service to schools and libraries, and offer reduced-price telecommunications services to rural health care facilities. Providers typically pass these charges through to consumers on their bills.

The federal government spent approximately \$5.4 billion on these

54. See CRANDALL & WAVERMAN, *supra* note 6, at 48.

55. *Id.* at 49.

56. *Id.* at 49–50.

57. *See id.* at 26.

58. *Id.* at 119–20.

59. *Id.* at 121.

universal service programs in 2004.⁶⁰ More than half of this money—\$3.5 billion—went to subsidize high-cost carriers, and \$759 million (14%) was spent on programs for low-income customers that help pay initial connection charges (Link-Up) and subsidize monthly phone bills (Lifeline).⁶¹ Most of the rest (\$1.2 billion, or 22%) subsidized internal wiring, telecommunications, and Internet service to schools and libraries.⁶² Thus, about 80% of the funds were devoted to subsidizing basic telephone service, with the remainder spent on the newer “universal service” programs created by the 1996 Telecommunications Act, which reduced the cost of Internet service to specified types of institutions.

1. Costs

The contributions take the form of a percentage assessment against sales of interstate and international services—primarily interstate long-distance and wireless phone services. Readjusted quarterly, the universal service “contribution factor” was 8.7% for the first two quarters of 2004 and 8.9% for the second two quarters.⁶³ The FCC proposed a 10.7% contribution factor for the first quarter of 2005, 11.1% for the second quarter, and 10.2% for the third quarter.⁶⁴ Though not formally called a tax, the assessment has all the economic effects of a tax. This funding mechanism for universal service programs generates substantial consumer costs in addition to the revenue it raises to fund universal service. This occurs because the contribution mechanism acts as a tax on services with relatively high price elasticities of demand, such as long distance and wireless.

Hausman and Shelanski estimated that the contributions required from long-distance service to fund discount Internet service for schools and libraries reduce the sum of consumer plus producer welfare by

60. See INDUS. ANALYSIS & TECH. DIV., FCC, TRENDS IN TELEPHONE SERVICE, 19-5 tbl. 19.1 (2005), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend504.pdf [hereinafter TRENDS IN TELEPHONE SERVICE].

61. *Id.*

62. *Id.*

63. Public Notice, FCC, Proposed First Quarter 2004 Universal Contribution Factor, 18 F.C.C.R. 25111 (2003); Public Notice, FCC, Proposed Second Quarter 2004 Universal Contribution Factor, 19 F.C.C.R. 4052 (2004); Public Notice, FCC, Proposed Third Quarter 2004 Universal Contribution Factor, 19 F.C.C.R. 10194 (2004); Public Notice, FCC, Proposed Fourth Quarter 2004 Universal Contribution Factor, 19 F.C.C.R. 18104 (2004).

64. Public Notice, FCC, Proposed First Quarter 2005 Universal Contribution Factor, 19 F.C.C.R. 24045 (2004); Public Notice, FCC, Proposed Second Quarter 2005 Universal Contribution Factor, 20 F.C.C.R. 5239 (2005); Public Notice, FCC, Proposed Third Quarter 2005 Universal Contribution Factor, 20 F.C.C.R. (forthcoming 2006) (2005), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-05-1664A1.pdf.

approximately \$0.65–0.79 for every dollar of revenue raised.⁶⁵ The marginal effect—that is, the effect of additional contributions—is even higher: \$1.25 for each additional dollar raised.⁶⁶ Thus, in addition to the \$1.89 billion that Hausman estimated the program would transfer from consumers of long-distance service to schools and libraries, the program would cost the economy \$2.36 billion annually due to reduced output of long-distance service.⁶⁷

It is possible to construct a similar estimate for interstate long distance using FCC data from the most recent year available, 2002. For domestic interstate long distance, federal universal service contributions averaged \$0.08 per conversation minute.⁶⁸ This price increase raised approximately \$2.7 billion in revenues, but it also reduced consumption of long-distance service.⁶⁹ As a result, the price increase reduced consumer welfare by about \$240 million and reduced producer welfare by about \$920 million, for a total reduction in economic welfare of \$1.16 billion.⁷⁰

Like long-distance service, demand for wireless service is relatively responsive to price, with U.S. demand elasticity most recently estimated in the range of -1.12 to -1.29.⁷¹ Estimates using international data are even higher, in the range of -1.71 to -3.62.⁷² Hausman estimated the impact on

65. Hausman & Shelanski, *supra* note 17, at 42–43.

66. *Id.*

67. Jerry Hausman, *Taxation by Telecommunications Regulation*, in 12 TAX POLICY AND THE ECONOMY 29, 31 (James M. Poterba ed., 1998).

68. See LANDE & LYNCH, *supra* note 38, at 30. Universal service contribution per interstate domestic conversation minute was calculated by subtracting \$0.01 access cost per interstate conversation minute in 2002 from \$0.018 total access and universal service contribution per interstate domestic conversation minute in 2002.

69. The \$2.7 billion figure is the product of \$0.008 per minute universal service contribution times 333.8 billion interstate domestic conversation minutes, as reported. *Id.*

70. See *infra* note 294 for calculation method and data sources. Although the revenue figure is larger than Hausman's estimate in 1998, the effects on economic welfare are smaller than he calculated because this study uses average figures derived from an estimate of the joint effects of interstate long-distance access charges and universal service contributions. Hausman's figures are estimates of the marginal effect of adding the universal service contributions on top of existing access charges. Since the efficiency loss associated with raising additional dollars exceeds the average efficiency loss, Hausman's marginal figures are higher.

71. J. Gregory Sidak, *Is State Taxation of the Wireless Industry Counterproductive?* 19 (2003), http://www.criterioneconomics.com/docs/sidak_pacific_research.pdf. See also Jerry Hausman, *Cellular Telephone, New Products, and the CPI*, 17 J. BUS. & ECON. STAT. 188, 191 (1999) (estimating a demand elasticity of approximately -0.5 with 1988–1993 data); Mark Rodini et al., *Going Mobile: Substitutability Between Fixed and Mobile Access* 16–17 (Center for Research on Telecommunications Policy, Working Paper 58), available at <http://ssrn.com/abstract=379661> (estimating an overall price elasticity of demand of -0.6 with 2000–2001 data).

72. See THOMAS W. HAZLETT & ROBERTO E. MUÑOZ, AEI-BROOKINGS JOINT CTR. FOR

the economy of all taxes applied to wireless, including the universal service contributions imposed by the FCC.⁷³ He calculated that every dollar raised reduced consumer plus producer welfare by approximately \$0.53, implying that wireless taxes cost the economy \$2.56 billion annually in addition to the \$4.79 billion raised annually in the late 1990s.⁷⁴ Additional taxes or contributions would, on average, entail a cost of \$0.72 for each dollar of revenue raised.

An adaptation of Hausman's method permits an estimate of the effects of wireless universal service contributions in more recent years. Universal service assessments on interstate wireless service raised approximately \$1.476 billion in 2004.⁷⁵ These assessments created a consumer welfare loss of \$48 million and a producer welfare loss of \$930 million for a total reduction in economic welfare of \$978 million.⁷⁶

2. Outcomes

The low-income and high-cost support programs are most closely related to the FCC's goals of ensuring that all Americans have affordable means of communication and remain on the telephone network. While these programs clearly transfer large amounts of money between different groups of users, the extent to which they promote universal service by actually increasing subscribership is much less clear.

a. Low-Income Programs

A 1997 study by Christopher Garbacz and Herbert G. Thompson, using data from the 1990 Decennial Census, found that expenditures on Lifeline and Link-Up programs increase telephone penetration, but by very small amounts.⁷⁷ A 10% increase in expenditures would lead to less than a 0.1% increase in the percentage of households with telephones.⁷⁸ Studies by the same authors using 2000 census data estimate that Lifeline and

REGULATORY STUDIES, A WELFARE ANALYSIS OF SPECTRUM ALLOCATION POLICIES 15 (2004), <http://www.aei-brookings.org/admin/authorpdfs/page.php?id=1024>; Gary Madden & Grant Coble-Neal, *Economic Determinants of Global Mobile Telephony Growth*, 16 INFO. ECON. & POL'Y 519, 531 (2004); Garbacz & Thompson (2005), *supra* note 48, tbl. 5 (finding a price elasticity of -0.45 with respect to the monthly charge using 1996-2001 data).

73. See Hausman, *supra* note 24.

74. *Id.*

75. See generally TRENDS IN TELEPHONE SERVICE, *supra* note 60 (multiplying total universal service outlays in tbl.19.1 by the percentage of contributions from wireless service providers in tbl.19.15).

76. See *infra* note 295 for calculation method and data sources.

77. Christopher Garbacz & Herbert G. Thompson, *Assessing the Impact of FCC Lifeline and Link-Up Programs on Telephone Penetration*, 11 J. REG. ECON. 67, 77 (1997).

78. *Id.*

Link-Up increase subscription at a cost of \$1,581–\$2,200 per additional subscription.⁷⁹ The authors conclude:

This is a direct result of the fact that a high proportion of program monies go to households that are already on the network and do not plan to leave. How to target those not on the network, while denying payments to those already on the network who are in no danger of leaving is a conundrum.⁸⁰

More recently, Garbacz and Thompson used the same method to assess the effects of Lifeline and Link-Up separately. They found that Link-Up had no effect on telephone penetration, and Lifeline was responsible for most of the effect they previously attributed to both programs jointly.⁸¹

A 2004 study confirms these estimates and inferences, finding that Lifeline and Link-Up programs increased total subscribership by about 0.155% in 2000.⁸² Overall, the programs cost about \$97 per household that receives subsidies, but increased subscribership at a cost of approximately \$1,899 per additional subscriber.⁸³

Finally, some studies find that the low-income programs have no effect on subscribership at all. One of the most extensive recent studies found that monthly charges have no influence on telephone penetration rates, and Link-Up programs sometimes increase and sometimes decrease penetration, depending on the data set used to estimate the relationship.⁸⁴

Studies of phoneless households help explain these results. The most common reasons that phoneless households give for not subscribing to telephone service is concern about uncontrollable usage-based charges, not the cost of basic local service. A path-breaking 1994 study of low-income households in New Jersey found that the cost of usage-related charges and optional services—such as long distance, collect calls, calling-card calls, and voicemail—were the most common reasons that households lacked phone service.⁸⁵ Heads of households noted that other family members or friends living with them had run up large usage-related bills in the past,

79. See Garbacz & Thompson (2002), *supra* note 47, at 320, 328; Garbacz & Thompson (2003), *supra* note 47, at 377.

80. Garbacz & Thompson (2002), *supra* note 47, at 328.

81. Garbacz & Thompson (2005), *supra* note 48, at 508 n.14.

82. See Daniel J. Ryan, *Universal Telephone Service and Rural America 17–18* (Apr. 30, 2004) (unpublished manuscript), http://www.telecom-economics.com/papers/Paper3_02-01-05.pdf.

83. *Id.* at 17–18.

84. See CRANDALL & WAVERMAN, *supra* note 6, at 94–104.

85. See Milton L. Muller & Jorge Reina Schement, *Universal Service from the Bottom Up: A Study of Telephone Penetration in Camden, New Jersey*, 12 THE INFO. SOC'Y 273, 274 (1996).

often without their knowledge or approval.⁸⁶ The authors concluded, "Income, employment, and other measures of wealth or poverty are strongly related to low penetration not because the price of basic local phone service is too high, but because low-income users who run up large usage-related bills are unable to cover them."⁸⁷

A 1995 survey of Texas households without telephones found that about half of them said the cost of local service makes it difficult to afford a telephone, but about 80% said they could afford to pay \$16 per month, the actual average cost of local service in Texas at the time of the survey.⁸⁸ The primary barriers to phone service were the fact that long-distance charges are variable and hence perceived as harder to control, the cost of reinstallation for people who previously had service disconnected due to nonpayment of bills, and difficulty in controlling who uses the phone.⁸⁹

Overall, the low-income programs (particularly Lifeline) appear to be a very ineffective way of increasing subscribership among low-income households; they may have no effect at all. On the federal level, they redistributed about \$700 million to low-income households in 2003;⁹⁰ thus, only about 13% of total universal service funding was targeted to low-income recipients. About 6.6 million Lifeline subscribers received an average of \$102.55, and 1.7 million Link-Up beneficiaries received one-time payments averaging \$18.13.⁹¹ Whether these programs are an efficient means of redistributing income to the poor depends on how one defines their cost and relevant alternatives.

All of these cost-per-additional-subscriber figures measure only expenditures, not the additional loss of consumer and social welfare that results from the assessments on long-distance and wireless service. If one attributes 13% of the reduction in economic welfare caused by universal service programs to the low-income programs, then they are responsible for a \$278 million reduction in overall economic welfare, or \$0.40 per dollar transferred.⁹²

86. *Id.* at 283.

87. *Id.* at 287.

88. See John B. Horrigan & Lodis Rhodes, *The Evolution of Universal Service in Texas*, Alliance for Public Technology (Sept. 1995), <http://www.apr.org/policy/lbjbrief.html>.

89. *Id.*

90. See FEDERAL-STATE JOINT BOARD ON UNIVERSAL SERVICE, UNIVERSAL SERVICE MONITORING REPORT, tbl. 2.4 (2004), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/Monitor/mr04-0.pdf.

91. *Id.* at tbls. 2.1, 2.4.

92. Table 2, *infra*, indicates that universal service contributions from long-distance service generated an excess burden of \$1.16 billion, and universal service contributions from wireless generated an excess burden of \$978 million, for a total of \$2.14 billion. Thirteen percent of \$2.14 billion is \$278 million. Dividing \$278 million by the amount of

b. High-Cost Support

The high-cost support programs, which account for more than half of the universal service fund's expenditures, appear to be a very costly way of increasing subscribership. The most recent study on this topic estimates that the cost of adding one subscriber through loop support was at least \$11,000 in 2000, up from \$3,350 in 1990.⁹³ The cost of adding one subscriber through local switching support was \$5,155, up from approximately \$2,000 in 1990.⁹⁴ This cost is substantially higher than the \$666 estimated by another study for 1985–93.⁹⁵

Another potential goal of high-cost support could be redistribution of wealth to rural households. Superficially, the program appears to accomplish substantial redistribution, with expenditures of \$3.5 billion in 2004.⁹⁶ Two factors, however, suggest that high-cost support is a highly inefficient redistribution program. First, the payments go to telephone companies, not households, and there is no guarantee that the \$3.5 billion subsidy actually creates \$3.5 billion worth of value for rural households. Many of the high-cost telephone companies are rural companies that still operate under rate-of-return regulation, which is notorious for creating incentives for inefficiency. Second, any resulting reductions in rural telephone rates are funded in large part by universal service assessments on long-distance and wireless. To the extent that rural subscribers use a substantial amount of long-distance service—because many of the people they call are outside the local calling area—or also subscribe to wireless, the high-cost program merely rearranges figures on their phone bills rather than providing any genuine savings. But because long-distance and wireless uses are highly sensitive to price, universal service assessments on those services reduce economic welfare substantially.

c. Schools and Libraries

The schools and libraries program might be interpreted as one means of accomplishing the FCC's performance goal of increasing broadband deployment. Outcome indicators in the *Performance and Accountability Report*, however, focus on broadband deployment to homes and businesses, so they provide no information about the effects of the schools and libraries

money transferred by low-income programs—\$700 million—equals 40%.

93. See Ryan, *supra* note 82, at 19.

94. *Id.* at 21.

95. See R.C. Eriksson et al., *Targeted and Untargeted Subsidy Schemes: Evidence from Post-Divestiture Efforts to Promote Universal Service*, 41 J.L. & ECON. 477, 498 (1998) (using data only for the Bell telephone companies, which receive a small portion of total high-cost support and may not be typical).

96. See TRENDS IN TELEPHONE SERVICE, *supra* note 60.

program.⁹⁷

The schools and libraries program is targeted in the sense that it gives lower discounts to wealthier institutions, but it is not clear whether this program has actually induced more schools and libraries to obtain Internet access. The National Center for Education Statistics reports that Internet access in public schools has increased steadily since 1994 to the point that 98% of schools now have Internet access.⁹⁸ Several of the center's statistical releases speculate that the schools and libraries program may have helped increase Internet access, but they provide no analysis demonstrating that the program caused Internet access to be any higher than it would have been in the absence of the program.⁹⁹ The most sophisticated analysis of the program has been conducted by the Urban Institute under contract to the U.S. Department of Education. This study finds that Internet connectivity for both high-poverty and low-poverty schools increased after implementation of the schools and libraries program, but connectivity for both was also increasing prior to the program.¹⁰⁰ Funding is effectively targeted to high-poverty and rural schools.¹⁰¹ Schools receiving subsidies report increases in deployment of Internet technology.¹⁰² The study contains no data or analysis demonstrating that Internet connectivity is higher than it would be in the absence of the program; indeed, several statistical tests in the study find no effect.¹⁰³

Similarly, there are no studies demonstrating whether any increase in Internet subscription or usage generated by the program has actually improved educational outcomes. The Urban Institute study sought to determine whether the technology subsidies have in fact expanded access to the Internet, but it does not purport to assess whether Internet access in schools has improved the quality of education.¹⁰⁴ The Office of Management and Budget's Program Assessment Rating Tool analysis

97. *Report, supra* note 20, at 24–25.

98. See Anne Cattagni & Elizabeth Farris Westat, U.S. Dep't of Educ., *Internet Access in U.S. Public Schools and Classrooms: 1994–2000*, (2001), available at <http://nces.ed.gov/pubs2001/2001071.pdf>.

99. See *id.*; see also Catrina Williams, U.S. Dep't of Educ., *Internet Access in U.S. Public Schools and Classrooms: 1994–99*, (2000), available at <http://nces.ed.gov/pubs2000/2000086.pdf>.

100. See MICHAEL E. PUMA ET AL., THE URBAN INST., *THE INTEGRATED STUDIES OF EDUCATIONAL TECHNOLOGY: A FORMATIVE EVALUATION OF THE E-RATE PROGRAM 21* (2002), available at http://www.urban.org/UploadedPDF/410579_ERateFinalReport.pdf.

101. *Id.* at v.

102. *Id.* at vii.

103. *Id.* at app. C.

104. See *id.* at 34.

concludes that the results of this program have not been demonstrated, awarding a score of 7 out of a possible 100 points for results and accountability.¹⁰⁵ The “results not demonstrated” rating means that data or measures are insufficient to permit assessment of whether the program has accomplished intended results.

D. Local Number Portability

Regulation and legislation have mandated number portability for different types of phone numbers at different times. In some sense, the earliest form of portability occurred when long-distance service was opened to competition in the 1970s, since customers did not have to switch phone numbers when switching long-distance carriers. Phone numbers for 800-service, however, were not portable until May 1, 1993.¹⁰⁶ Prior to then, a business with an 800-number that wanted to switch long-distance carriers had to switch phone numbers as well.

More recently, the Telecommunications Act of 1996 required the FCC to make rules requiring wireline and wireless local service providers to implement local number portability.¹⁰⁷ Under the Act and the FCC’s rules, local number portability is defined as “the ability of users of telecommunications services to retain, at the same location, existing telecommunications numbers without impairment of quality, reliability, or convenience when switching from one telecommunications carrier to another.”¹⁰⁸

Wireline carriers were required to introduce local number portability as early as February 1, 1999.¹⁰⁹ Wireless local number portability began on November 24, 2003.¹¹⁰ The purpose of local number portability is outlined in the Commission’s *First Report and Order*: “The ability of end users to

105. OFFICE OF MGMT. AND BUDGET, OTHER INDEPENDENT AGENCIES PART ASSESSMENTS 58-60 (2004), available at <http://www.whitehouse.gov/omb/budget/fy2005/pma/agencies.pdf>.

106. V. Brian Viard, Do Switching Costs Make Markets More or Less Competitive?: The Case of 800-Number Portability 4 (Sept. 9, 2004) (unpublished manuscript), available at <https://gsbapps.stanford.edu/researchpapers/library/RP1773R2.pdf>.

107. 47 U.S.C. § 251(b)(2) (2000). See also Telephone Number Portability; CTIA Petitions for Declaratory Ruling on Wireline-Wireless Porting Issues, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 18 F.C.C.R. 23697, para. 3 (2003) [hereinafter Telephone Number Portability].

108. 47 U.S.C. § 153(30) (2000). See Telephone Number Portability, *supra* note 107.

109. See 47 C.F.R. § 52.33(a)(1) (2004); see also FCC, CONSUMER INFORMATION: LOCAL TELEPHONE NUMBER PORTABILITY (Jan. 1999), http://www.fcc.gov/Bureaus/Common_Carrier/Factsheets/portable.html.

110. Thomas M. Lenard & Brent D. Mast, *Taxes and Regulation: The Effects of Mandates on Wireless Phone Users*, PROGRESS ON POINT, Oct. 2003, at 10, available at <http://www.pff.org/issues-pubs/pops/pop10.18wirelessmandates.pdf>.

retain their telephone numbers when changing service providers gives customers flexibility in the quality, price, and variety of telecommunications services they can choose to purchase.”¹¹¹

Regulations requiring local number portability give consumers the ability to keep their phone numbers when switching between local service providers, be it a landline or wireless provider. The caveat, as the word “local” indicates, is that the provider is only required to “port” the number if the individual changes providers within the same metropolitan area.¹¹² An individual may switch from a landline provider to a wireless provider, as well as between wireless and landline providers. Individuals switching between wireless providers will also have to change phones, due to differences in technology used by the different providers. FCC staff have noted, “[e]ven if your phone could be reprogrammed to work on a new network, carriers usually don’t allow this.”¹¹³

The principal argument for local number portability is that it facilitates consumer choice. If individuals are no longer required to change phone numbers when switching carriers, they may be more likely to switch carriers if they see enough benefit in doing so. Consumers who want to switch no longer experience the inconvenience and other costs associated with changing phone numbers. Instead, all consumers must pay for the systems and software that give them the option of taking their phone numbers with them when they switch carriers.

1. Costs

No research has assessed the costs of number portability in long-distance service. Local number portability has generated more significant debate and analysis. Local number portability requires phone companies to purchase new software, acquire new equipment, construct new number databases, perform intercarrier testing, and implement new business procedures.¹¹⁴ Firms are allowed to charge a monthly fee to recover the costs they will incur; they may itemize it as a separate fee on customers’ bills or include it in the monthly rate.¹¹⁵ Local wireline carriers were permitted to implement a charge for local number portability as early as

111. Telephone Number Portability, *First Report and Order and Further Notice of Proposed Rulemaking*, 11 F.C.C.R. 8352, para. 30 (1996) [hereinafter *First Report and Order*].

112. See *A Conversation on Wireless Local Number Portability: Video Updated* (FCC May 24, 2005), <http://wireless.fcc.gov/wlnp/> [hereinafter *Conversation*].

113. See *id.*

114. See Lenard & Mast, *supra* note 110, at 2 (indicating that these costs originally applied only to wireless local number portability, but wireline carriers will experience these same types of costs).

115. See *Conversation*, *supra* note 112.

February 1999.¹¹⁶ All other carriers—wireless and wireline—can recover number portability costs however they choose, so long as they do not violate other FCC regulations in the process.¹¹⁷

a. Wireline Number Portability

Local wireline carriers have been allowed to collect a local number portability charge since February 1999.¹¹⁸ In 1999, the FCC approved residential number portability charges for major phone companies that ranged from \$0.23 to \$0.48 per month.¹¹⁹ A web search performed in July 2004 found a variety of number portability charges in that range. In addition, some phone companies charge businesses substantially more. It is possible to calculate a conservative estimate of wireline number portability's cost by assuming that the average wireline carrier charges about \$0.35 per month, per line—the midpoint of the figures allowed by the FCC. Multiplying this figure by the number of incumbent and competitor phone lines yields an annual cost between \$762 million in 2003 and \$809 million in 2000.¹²⁰ The cost peaked in 2000 because the total number of wireline phone lines has fallen every year since then.¹²¹ The total cost over five years is approximately \$4 billion.¹²²

After five years, the phone companies will, in theory, have to absorb the cost of local number portability. It is not clear whether firms will really bear the cost of portability after five years. The additional expenditures that portability entails are a cost of doing business imposed on all competitors. As a result, competitors whose rates are not regulated, such as wireless, will likely pass these costs through to consumers in their prices even if they cannot impose an explicit number portability charge. For incumbent landline telephone companies subject to cost-based regulation, portability costs will likely make their way into the general pool of costs that can be recovered from consumers. The principal carriers unable to pass portability costs directly through to consumers after five years may be the larger

116. 47 C.F.R. § 52.33(a)(1) (2004).

117. *Id.*

118. *Id.*

119. See Public Notice, FCC, FCC Investigation Produces Lower Number Portability Charges for Customers of U S West Communications, Inc., (July 9, 1999), http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrcc9043.html.

120. There were 193 million wireline lines in 2000. That number fell to 181 million in 2003. See FCC, Local Telephone Competition: Status as of December 31, 2003, tbl.1 (2004), http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/lcom0604.pdf [hereinafter Local Telephone Competition].

121. *Id.*

122. Figure calculated by multiplying \$0.35 times annual line counts from 1999–2003 that appear. *Id.*

incumbents that are subject to price cap regulation rather than cost-based regulation. To the extent that price caps are periodically adjusted, however, even these incumbents may have some latitude to pass portability costs through to consumers, though the pass-through would not be very transparent.

As with other price increases, those caused by the costs of mandated number portability will also tend to reduce consumer and producer welfare by reducing use of the service. In the case of wireline telephone service, this effect is likely negligible, since local wireline telephone subscription is not very responsive to price changes. Therefore, the total cost to wireline customers of number portability is likely just the cost of the monthly charge.

b. Wireless Number Portability

Wireless local number portability charges are often opaque because carriers sometimes combine them with other regulatory charges.¹²³ In mid-2004, Verizon Wireless listed a separate portability charge of \$0.40 per month, and one media report pegged Sprint's portability charge at \$0.63 per month.¹²⁴ The other major carriers lump the portability charge in with other regulatory charges.¹²⁵ In November 2004, Verizon Wireless announced that it would eliminate its fee, and Sprint cut its fee to \$0.25 per month.¹²⁶ Verizon claimed that costs had fallen but also noted the change would make its service more competitive with other carriers.¹²⁷ It is not clear whether these changes in charges actually reflect cost changes or simply reflect a decision to cut prices by eliminating an opaque fee that annoys many consumers. Even if the fee falls to zero, consumers still pay costs associated with number portability because the price of wireless service is higher than it would be in the absence of these costs.

A study released the month before wireless number portability became final used figures announced by major carriers to estimate the

123. See *FCC Urged to Ban 'Misleading' Charges on Phone Bills*, TELECOM. POL'Y REPORT, Mar. 31, 2004, http://www.findarticles.com/p/articles/mi_m0PJR/is_13_2/ai_114794726 (last visited Nov. 19, 2005) (national wireless carriers often list the charge resulting from local number portability with other regulatory charges).

124. See Bruce Meyerson, *Verizon Doubles Fee to Keep Number*, MSNBC, Nov. 25, 2003, <http://msnbc.msn.com/id/3606462>.

125. Fees vary among carriers and have changed over time. Carriers charged the following fees as of July 2004: Cingular charged between \$0.56 and \$1.25, AT&T charged \$1.75, T-Mobile charged \$0.86, and Nextel charged \$1.55. Yuki Noguchi, *Verizon and Sprint to Cut Fee For Transferring Cell Numbers*, WASH. POST, Nov. 16, 2004, at E05, available at <http://www.washingtonpost.com/wp-dyn/articles/A52986-2004Nov15.html>.

126. *Id.*

127. *Id.*

monthly cost per customer.¹²⁸ The study estimated that the upfront costs of portability averaged \$0.213 per subscriber per month, amortized over three years.¹²⁹ Ongoing costs averaged \$0.285 per subscriber per month for the first five years.¹³⁰ These figures are consistent with Verizon's and Sprint's charges in July 2004.

The FCC reported that there were 159 million wireless subscribers at the end of 2003 and 182 million at the end of 2004.¹³¹ Average subscribership for 2004 was likely close to 170 million, the midpoint of these two year-end figures. If the cost of wireless local number portability is approximately \$0.50 per subscriber per month, the total cost was \$6 per subscriber per year, or approximately \$1.02 billion. Because demand for wireless service is highly sensitive to price, these increased costs likely reduce wireless subscription, consumer welfare, and producer welfare. These effects are most accurately estimated as a proportionate share of the effects of several regulatory changes that all began to affect wireless service in 2003 and 2004. The price increases induced by wireless local number portability reduced consumer welfare by approximately \$28 million and reduced producer welfare by approximately \$540 million, for a total reduction in economic welfare of \$568 million.¹³²

Some authors argue that the increased costs to firms associated with customer switching, or "churn," should also be counted as costs of the regulation.¹³³ Predicted rates of churn would increase the cost per customer by \$1 or more per month.¹³⁴ Like expenditures on new software and databases, the marketing expenditures become an additional cost imposed on all competitors. Since wireless service is relatively competitive, there is no pool of excess profits that companies would compete away through increased marketing efforts. Consumers would ultimately have to pay for the bulk of any increased marketing efforts that companies take to retain customers.

However, it is not clear how a significant increase in churn could be consistent with the assumption that wireless is highly competitive. If

128. See Lenard & Mast, *supra* note 110, at 14.

129. *Id.* at tbl. 3.

130. *Id.* at 19.

131. See Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Tenth Report*, 20 F.C.C.R. (forthcoming 2006), tbl 2 (2005), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-173A1.pdf [hereinafter *Tenth Report*].

132. For calculation method and data sources see *infra* note 296.

133. See Lenard & Mast, *supra* note 110, at 20–22.

134. *Id.*

wireless is already highly competitive, then why would significant numbers of customers suddenly choose to switch providers? Alternatively, a sudden increase in churn associated with number portability would be consistent with the theory that wireless providers were charging above-competitive prices, at least to that segment of customers who refrained from switching solely because numbers were not portable. For these reasons, inclusion of churn as a cost of regulation is questionable.

2. Outcomes

The principal outcome regulators expect from local number portability is increased competition, which should lower phone bills or generate other consumer benefits. A sufficiently large increase in competition could generate price reductions or other benefits that outweigh the effects of local number portability's costs.

The FCC's *Report* describes number portability as "an important step in promoting competition and customer choice."¹³⁵ The *Report's* outcome indicators for competition show the following statistics: (1) the percentage of U.S. population in areas with three or more wireline providers rose from 67% in 2000 to 84% in 2003; (2) the percentage of the U.S. population in areas with three or more wireless providers rose from 91% in 2000 to 97% in 2003; (3) the Consumer Price Index for telephone service fell by 4% between January 1998 and May 2004; and (4) the average price of wireless telephone calls fell from \$0.18 per minute in 2000 to \$0.10 per minute in 2003.¹³⁶

Local number portability may contribute to price reductions, and it may even increase the number of competitors if it makes market entry worthwhile for some competitors who would not otherwise have entered. The FCC's *Report*, however, provides no evidence that local number portability caused the reported price reductions and increases in competitive options. Indeed, wireless number portability could not have caused any of the reported statistical results, since it did not become effective until November 2003.

The FCC quoted several industry sources in its *First Report and Order* that suggest the absence of number portability curtailed competition:

We note that several studies described in the record demonstrate the reluctance of both business and residential customers to switch carriers if they must change numbers. For example, MCI has stated that, based on a nationwide Gallup survey, 83 percent of business customers and 80 percent of residential customers would be unlikely to change local

135. *Report*, *supra* note 20, at 32.

136. *Id.* at 32-33.

service providers if they had to change their telephone numbers. Time Warner Holdings states that consumers are 40 percent less likely to change service providers if a number change is required. Citizens Utilities notes that approximately 85 percent of the discussions that its subsidiary, ELI, has with potential customers about switching providers end when those potential customers learn that they must change their telephone numbers. The study commissioned by Pacific Bell concludes that, without portability, new entrants would be forced to discount their local exchange service and other competing offerings by at least 12 percent below the incumbent LECs' prices in order to induce customers to switch carriers due to customers' resistance to changing numbers.¹³⁷

Many customers balk at changing phone numbers because it is costly to do so. A consumer who changes phone numbers needs to notify others of the change. A business that changes phone numbers may need to advertise the change and would likely need to print new letterhead, business cards, etc. The absence of number portability thus creates a "switching cost" that discourages consumers from switching carriers.

A number of theoretical studies examine the possible impact of switching costs on competition and consumer welfare, both in general and with respect to phone number portability. In theory, the absence of number portability may or may not reduce consumer welfare. Switching costs decrease demand elasticity and rivalry, essentially creating submarkets for individual firms' products that could allow firms to charge higher prices. "Differentiating functionally identical products through switching costs, however, yields no benefits to set against the cost of restricted output."¹³⁸ On the other hand, switching costs may intensify rivalry for new customers because it is easier to retain these customers after they have signed up. Any profit that firms hope to earn as a result of switching costs may in effect be refunded to consumers in advance, when firms compete to sign up new customers. These theoretical considerations suggest that mandated number portability is less likely to benefit consumers when the market is already competitive and more likely to benefit consumers when the market starts out monopolized.¹³⁹

Few studies attempt to measure the effect of switching costs in telecommunications. One presents empirical results suggesting that switching costs impeded price reductions in long-distance service between 1984 and 1993.¹⁴⁰ Another finds that lowering the price that U.S.

137. *First Report and Order*, *supra* note 111, para. 29 (citations omitted).

138. See Paul Klemperer, *Markets with Consumer Switching Costs*, 102 Q.J. ECON. 375, 377 (1987).

139. See *id.*

140. See Christopher R. Knittel, *Interstate Long Distance Rates: Search Costs, Switching*

consumers pay when they switch long-distance carriers from \$5 to \$2—and making up the difference through increased access charges—could increase consumer welfare by several hundred million dollars, largely by redistributing wealth from long-distance companies to consumers.¹⁴¹ This kind of change is similar to mandated number portability because it converts a cost borne by customers when they switch carriers into a cost that all customers must bear, regardless of whether they ever switch. Another recent study estimated that the net effect of 800-number portability was to reduce the price of toll-free service by approximately 14%.¹⁴² This result implies that the procompetitive effects of 800-number portability outweighed any associated costs.

Unfortunately, no data or studies assess the extent to which local number portability has affected competition or prices. As of September 2004, the FCC saw no evidence that customer churn increased following implementation of wireless local number portability.¹⁴³ The FCC did, however, cite media and analyst reports suggesting that wireless firms launched aggressive customer retention efforts when portability was imminent.¹⁴⁴

Raw FCC data show that porting of telephone numbers has steadily increased.¹⁴⁵ The number of numbers ported to a wireline carrier rose from 80 in 1997 to 6.8 million in 2003.¹⁴⁶ Wireless portability started in November 2003, and 807,802 numbers were ported to wireless carriers in the fourth quarter of 2003.¹⁴⁷ These figures are a small fraction of the 180 million landlines and 157 million wireless lines reported for the year.¹⁴⁸ In any case, it would be a mistake to infer that the number of ported phone numbers measures the effect of portability on competition, or even on customer switching. To find the effect of portability on switching, one would need to estimate how many of the customers who ported phone numbers would have refrained from switching carriers in the absence of number portability. To assess the ultimate effect on consumers, one would need to determine whether portability caused any price reductions or other consumer benefits to occur.

Costs, and Market Power, 12 REV. INDUS. ORG. 519 (1997).

141. See Douglas A. Galbi, *Regulating Prices for Shifting Between Service Providers*, 13 INFO. ECON. & POL'Y 181, 194–96 (2001).

142. Viard, *supra* note 106, at 17.

143. See *Tenth Report*, *supra* note 131, para. 165.

144. *Id.*

145. See TRENDS IN TELEPHONE SERVICE, *supra* note 60, at 8–11 tbl. 8.8.

146. *Id.*

147. *Id.*

148. See *Local Telephone Competition*, *supra* note 120.

E. Enhanced 911 Service

Basic 911 service requires wireline and wireless carriers to route 911 calls to a “Public Safety Answering Point.”¹⁴⁹ Enhanced 911 requires the carrier to identify the caller’s location to emergency dispatchers.¹⁵⁰

1. Costs

We found no estimates of the costs wireline carriers incur to provide enhanced 911. The cost issues are more serious for wireless carriers, since their phones are mobile. Wireless carriers can implement enhanced 911 by using either network-based or handset-based technology, such as global positioning systems in mobile phones. Wireless carriers had to be ready to offer some aspects of enhanced 911 service in 1998. Cost data are sketchy, but a Progress and Freedom Foundation study estimated that implementing enhanced 911 would cost wireless carriers approximately \$0.61 per subscriber per month during the first five years.¹⁵¹ Multiplying this figure by the estimated average of 170 million subscribers in 2004 yields a total annual cost of \$1.25 billion. If this cost is passed through to consumers, the price increase would reduce consumer welfare by \$34 million annually and reduce producer welfare by \$659 million annually, for a total annual reduction in economic welfare of \$693 million.¹⁵²

In May 2005, the FCC decided that Voice over Internet Protocol (“VoIP”) providers must include enhanced 911 as part of their standard service package.¹⁵³ No cost estimates are available for this mandate. The FCC surely reduced the cost by declining to require VoIP providers to automatically identify the customer’s location. For the time being, the customer is responsible for inputting and updating this information.¹⁵⁴

2. Outcomes

To assess the outcome of its wireless enhanced 911 initiatives, the FCC tracks the number of 911 answering centers, or “Public Service Answering Points,” that receive more precise “Phase II” location information from wireless providers.¹⁵⁵ This figure grew by 444%—from

149. Lenard & Mast, *supra* note 110, at 34.

150. *Id.*

151. *Id.* at 38.

152. *Infra* note 298 (describing the calculation method and data sources).

153. See Public Notice, FCC, Commission Requires Interconnected VoIP Providers to Provide Enhanced 911 Service (May 19, 2005), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-258818A1.pdf.

154. *Id.*

155. *Report, supra* note 20, at 59.

350 to 1,904—between February 2003 and August 2004.¹⁵⁶ The *Report* provides no statistics that put these figures in context, so it is not clear whether a substantial percentage of Public Service Answering Points or population is now covered. In addition, this information says nothing about the beneficial outcomes that occurred for citizens as a result of expanded 911 coverage.

One economic study has assessed health and hospital cost outcomes that could be attributed to enhanced 911 service.¹⁵⁷ It examines effects solely for cardiac patients, for whom timeliness of emergency care can be a crucial survival factor.¹⁵⁸ Data for the study cover several years but were gathered prior to 2000, so it can best be interpreted as a study of the effects of wireline enhanced 911.¹⁵⁹ Enhanced 911 reduced the risk of death within six hours of the emergency phone call by 60%, and reduced the risk of death within 48 hours by 35%.¹⁶⁰ Even assuming a relatively low value of life saved (\$450,000), the authors estimated annual benefits of \$684,000 for a typical county, compared to an estimated annual cost of \$800,000.¹⁶¹ In addition, adoption of either basic or enhanced 911 lowered hospitals' average total costs of treating cardiac patients by 16%—about \$1,000 per patient, or \$304,000 for the average county.¹⁶² The combination of risk and cost reduction suggests that enhanced 911 reduced the need for more extensive treatment by enabling patients to receive care sooner. Since cardiac emergencies account for less than 10% of all 911 calls, these figures suggest that the benefits of wireline 911 are substantial.¹⁶³ The finding is consistent with a 1985–89 study in Iowa, which found that cardiac patients with ordinary 911 service were 1.62 times more likely to survive than patients without 911.¹⁶⁴

No studies assess whether similar benefits flow from wireless 911. Consumers clearly make an increasing number of emergency calls from wireless phones, but it is not clear whether these are the same types of emergencies for which wireline 911 has generated benefits.¹⁶⁵

156. *Id.*

157. See Susan Athley & Scott Stern, *The Impact of Information Technology on Emergency Health Care Outcomes*, 33 RAND J. ECON. 399 (2002).

158. *Id.* at 401.

159. *Id.* at 400.

160. *Id.* at 427.

161. *Id.* at 428.

162. See *id.* at 427–28.

163. *Id.* at 428.

164. Sue A. Joslyn et al., *Survival from Out-of-Hospital Cardiac Arrest: Effects of Patient Age and Presence of 911 Emergency Medical Services Phone Access*, 11 AM. J. EMERGENCY MED. 200, 203 tbl. 5 (1993).

165. See Lenard & Mast, *supra* note 110, at 39–40.

F. Miscellaneous Wireless Mandates

Two other regulatory mandates currently have more of an effect on the cost of wireless service than on the cost of wireline service: number pooling and CALEA. The FCC started wireless number pooling in November 2002.¹⁶⁶ CALEA applies to both wireline and wireless carriers, but the legislation appropriated \$500 million to help cover the cost of necessary modifications to equipment installed prior to 1995.¹⁶⁷ Thus, it is likely that taxpayers rather than wireline telephone subscribers bore most of the costs CALEA imposed on wireline carriers, and these costs are largely in the past. Wireless subscribers, on the other hand, receive no similar benefit. No federal appropriation subsidizes the CALEA-related expenses of wireless firms. Since all wireless carriers must bear these costs, it is likely that they are passed on to consumers.

1. Number Pooling

Number pooling means the assignment of wireless phone numbers to companies in blocks of 1,000 instead of 10,000. The FCC did this because carriers were using fewer than half of their assigned numbers, and they were running out of area codes. When numbers were assigned in blocks of 10,000, all numbers under the same “central office code,” the first three local digits of the number, were assigned to the same company. With pooling, multiple companies may use the same central office code within an area code.

Number pooling requires network upgrades to route calls to the right company sharing a central office code. Cost estimates are even less exact than for enhanced 911. The principal economic study estimating the costs finds that they would average \$0.168 per customer per month during the first five years.¹⁶⁸ Multiplying this figure by the estimated average number of subscribers in 2004 yields a total annual cost of \$348 million. If this cost is passed through to consumers, the price increase would reduce consumer welfare by \$9.5 million annually and reduce producer welfare by \$184 million annually, for a total annual reduction in economic welfare of \$193 million.¹⁶⁹ We found no estimates of the benefits of number pooling.

166. *See id.* at 23.

167. *Id.* at 29.

168. *See id.* at 27.

169. *Infra* note 299 (describing the calculation method and data sources).

2. CALEA

CALEA requires telecommunications firms to modify their networks to permit electronic surveillance by law enforcement officials.¹⁷⁰ The estimated monetary cost is \$0.238 per customer per month during the first five years.¹⁷¹ Multiplying this figure by the estimated average number of subscribers in 2004 yields a total annual cost of \$491 million. If this cost is passed through to consumers, the price increase would reduce consumer welfare by \$13 million annually and reduce producer welfare by \$259 million annually, for a total annual reduction in economic welfare of \$273 million.¹⁷² No estimates are available of the additional costs borne by law-abiding citizens who have their privacy invaded unnecessarily.¹⁷³

Beneficial impacts of CALEA would be improvements in law enforcement and national security. Statistics show that the number of wiretaps has increased steadily over the past several decades, but it is not obvious from the raw data that CALEA has affected this trend.¹⁷⁴ The FCC's *Report* mentions CALEA-related activities but provides no information about relevant outcomes.¹⁷⁵ An assessment of outcomes would need to demonstrate not just that CALEA improved law enforcers' ability to gather information through wiretaps, but also that such information has had a material effect on public safety or national security.

G. Spectrum Management

Electric and magnetic fields produce waves that move through space at different frequencies. A wave's frequency is the number of times that its crest passes a given point in a period of time. The electromagnetic spectrum is the set of all possible frequencies, and the radio spectrum is the set of frequencies used for radio, broadcasting, and other communications.¹⁷⁶ The FCC manages and allocates portions of the spectrum used by parties other than the federal government.

Technically, the FCC does not assign, allocate, auction, or license spectrum. Rather, it licenses devices that use various portions of the

170. Lenard & Mast, *supra* note 110, at 27–28.

171. *See id.* at 29.

172. *See infra* note 300 (describing the calculation method and data sources).

173. *See id.* at 30.

174. *Id.* at 30–33.

175. *Report*, *supra* note 20, at 56.

176. Electromagnetic spectrum, http://en.wikipedia.org/wiki/Electromagnetic_spectrum (last visited Nov. 19, 2005).

spectrum.¹⁷⁷ FCC spectrum policy affects telecommunications competition and consumer welfare in two ways. First, an FCC rulemaking determines the amount of spectrum that can be used for a given purpose, such as broadcasting or wireless communications, and myriad other details.¹⁷⁸ Second, the FCC's method for issuing licenses to use spectrum determines who receives licenses, and how quickly.

A major improvement in spectrum management occurred when Congress authorized the FCC to auction licenses in 1993. Prior to 1981, the FCC decided whose equipment could use which spectrum through "comparative hearings." In 1981, Congress authorized the FCC to allocate licenses through lotteries.¹⁷⁹ The methods used to award licenses prior to auctions cost consumers billions of dollars due to delayed adoption of wireless communications services.¹⁸⁰ Lottery entrants, for example, had to manufacture applications that "proved" they were qualified to operate wireless telecommunications systems, at a cost of \$500 million to \$1 billion between 1986 and 1989.¹⁸¹ Most licenses awarded by lottery were then resold. Auctions eliminated such waste. The first license auctions occurred 34 years after they were proposed by Nobel Laureate Ronald Coase, who was asked by an FCC commissioner when he testified on his proposal before the FCC in 1959, "Is this all a big joke?"¹⁸²

Spectrum has not, however, been privatized; the auction winners simply get to operate equipment that uses the spectrum for specified purposes.¹⁸³ Formally, spectrum is owned in common by the American

177. Thomas W. Hazlett et al., *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* 102 (AEI-Brookings Joint Ctr. on Regulatory Studies, Working Paper No. 01-02, Jan. 2001), available at <http://www.aei-brookings.org/admin/authorpdfs/page.php?id=140>.

178. *Id.* at 40 (The rulemaking "defines the service allowed, what business model that business will be conducted under (common carrier, private carrier, broadcaster, etc.), technical standards, the number of competitors in the marketplace, geographic size of licenses, terms of license renewal and license transfer, and myriad business details.").

179. *Id.* at 41.

180. *See id.* at 41; *see also* FCC Report to Congress on Spectrum Auctions, *Report*, 13 F.C.C.R. 9601, 9612-14 (1997) [hereinafter *Spectrum Auctions Report*].

181. *See* Hazlett et al., *supra* note 177, at 111.

182. *Id.* at 5.

183. *See* Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Comments of 37 Concerned Economists* 3 (Feb. 7, 2001), available at <http://www.aei-brookings.org/admin/authorpdfs/page.php?id=176>, which states:

[A]uctions for licenses have not changed the underlying system of spectrum allocation. Radio frequencies are allocated to services by an FCC rule making. The opportunity cost of spectrum is evaluated not by market participants but by regulators. With few exceptions, spectrum continues to be offered to the market

public, and the FCC merely regulates its use by issuing licenses.¹⁸⁴ The design and implementation of license auctions has generated substantial scholarly research and commentary, often focused on whether the design of the auction ensures that each license will go to the bidder that values it most highly. Aspects of the FCC's auction design have generated substantial criticism, but there appears to be a general consensus among researchers that auctions are a vast improvement over prior methods of awarding licenses.¹⁸⁵

1. Costs

Spectrum management policy, however, continues to generate substantial consumer costs. Licenses have become somewhat more flexible in recent years. Nevertheless, FCC decisions, rather than market transactions, determine the general uses to which various blocks of spectrum will be put.¹⁸⁶ Defense and local government get to use large

only as allocated and no price can be offered to reallocate it from the officially designated use.

See also Hazlett, *supra* note 177, at 102, which states:

Indeed, to be issued an FCC license, an applicant must first certify that it will not assert any property interests in radio spectrum. This is so fundamental to U.S. communications law that it predates the 1927 Radio Act, being enacted in Senate Joint Resolution 125, signed into law by President Calvin Coolidge on Dec. 8, 1926.

(citations omitted).

184. See Hazlett et al., *supra* note 177, at 41–42.

185. See generally Lawrence M. Ausubel et al., *Synergies in Wireless Telephony: Evidence from the Broadband PCS Auctions*, 6 J. ECON. & MGMT. STRATEGY 497 (1997); Mark M. Bykowski et al., *Mutually Destructive Bidding: The FCC Auction Design Problem*, 17 J. REG. ECON. 205 (2000); Peter Cramton, *Spectrum Auctions*, in 1 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS 605 (Martin Cave et al. eds., 2002); Thomas W. Hazlett, *Spectrum Flash Dance: Eli Noam's Proposal for 'Open Access' to Radio Waves*, 41 J.L. & ECON. 805 (1998); HAZLETT & MUÑOZ, *supra* note 72; Evan R. Kwerel & Gregory L. Rosston, *An Insiders' View of FCC Spectrum Auctions*, 17 J. REG. ECON. 253 (2000); ANTHONY M. KWASNICA ET AL., INTERDISCIPLINARY CENTER FOR ECONOMIC SCIENCE, A NEW AND IMPROVED DESIGN FOR MULTI-OBJECT ITERATIVE AUCTIONS (2002), <http://www.ices-gmu.org/pdf/materials/372.pdf>; Patrick S. Moreton & Pablo T. Spiller, *What's In the Air: Interlicense Synergies in the Federal Communications Commission's Broadband Personal Communication Service Spectrum Auctions*, 41 J.L. & ECON. 677 (1998); DAVID PORTER ET AL., INTERDISCIPLINARY CENTER FOR ECONOMIC SCIENCE, COMBINATORIAL AUCTION DESIGN (2003), <http://www.ices-gmu.net/pdf/materials/419.pdf>; DAVID PORTER, INTERDISCIPLINARY CENTER FOR ECONOMIC SCIENCE, AN EXPERIMENTAL EXAMINATION OF DEMAND REDUCTION IN MULTI-UNIT VERSIONS OF THE UNIFORM-PRICE, VICKREY, AND ENGLISH AUCTIONS, <http://www.ices-gmu.net/pdf/materials/403.pdf>; *Spectrum Auctions Report*, *supra* note 180.

186. See Evan Kwerel & John Williams, *A Proposal for a Rapid Transition to Market Allocation of Spectrum 4* (Office of Plans and Policy, Working Paper No. 38, 2002), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228552A1.pdf. See also Arthur De Vany, *Implementing a Market-Based Spectrum Policy*, 41 J.L. & ECON. 627 (1998).

blocks of spectrum for free, and as a result such spectrum is often used inefficiently.¹⁸⁷ As the FCC's Spectrum Policy Task Force noted:

As a general proposition, flexibility in spectrum regulation is critical to improving access to spectrum. In this context, "flexibility" means granting both licensed users and unlicensed device operators the maximum possible autonomy to determine the highest valued use of their spectrum, subject only to those rules that are necessary to afford reasonable opportunities for access by other spectrum users and to prevent or limit interference among multiple spectrum uses. . . . In most instances, a flexible use approach is preferable to the Commission's traditional "command-and-control" approach to spectrum regulation, in which allowable spectrum uses are limited based on regulatory judgments.¹⁸⁸

The FCC affects the price of wireless telephone and data services by determining how much spectrum can be used for each service. The fact that spectrum users must now purchase licenses through auctions does not increase the prices consumers pay for wireless services; auctions merely allow the government to collect some of the profit from the firms using the spectrum.¹⁸⁹ But, by creating an artificial scarcity of spectrum, a critical input, regulators increase the prices that wireless firms can charge consumers by reducing the supply of wireless services. These price increases and resulting consumer welfare losses would occur regardless of whether the FCC awarded licenses through auctions, hearings, or lotteries.

The explosive growth of wireless service in the 1990s demonstrates how spectrum policy can have large effects on consumer welfare. In the 1980s, the federal government licensed only two cellular providers in each market.¹⁹⁰ In 1993, Congress directed the FCC to begin to auction spectrum, and the FCC responded by auctioning almost twice as much spectrum as it had already allocated to cell phone service, effectively making room for at least six wireless providers.¹⁹¹

187. See Jerry Hausman, *From 2G to 3G: Wireless Competition for Internet-Related Services*, in BROADBAND: SHOULD WE REGULATE HIGH-SPEED INTERNET ACCESS? 106, 120–21 (Robert W. Crandall & James H. Alleman eds., 2002).

188. FCC, SPECTRUM POLICY TASK FORCE REPORT 16 (2002), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-228542A1.pdf. See also FCC, SPECTRUM POLICY TASK FORCE: ONE YEAR LATER 7 (2003) (updating the FCC initiatives implementing the Task Force's recommendations as of 2003), <http://www.fcc.gov/sptf/files/presentation-111303.pdf>.

189. See EVAN KWEREL, FCC, SPECTRUM AUCTIONS DO NOT RAISE THE PRICE OF WIRELESS SERVICES: THEORY AND EVIDENCE (2000), <http://wireless.fcc.gov/auctions/data/papersAndStudies/SpectrumAuctionsDoNotRaisePrices.pdf>.

190. Robert W. Crandall & Jerry A. Hausman, *Competition in U.S. Telecommunications Services: Effects of the 1996 Legislation*, in DEREGULATION OF NETWORK INDUSTRIES: WHAT'S NEXT? 102 (Sam Peltzman & Clifford Winston eds., 2000).

191. *Id.* at 102–03.

Between 1984 and 1995, when there were just two cell phone companies per market, inflation-adjusted rates fell by an average of between 3 and 4% annually.¹⁹² Entry of new competitors prompted price reductions averaging 17% annually between 1995 and 1999.¹⁹³ More recent trends show up in the U.S. Bureau of Labor Statistics' index of wireless telecommunications prices, which begins in 1997. During the past six years, inflation-adjusted wireless prices have fallen by approximately 40%.¹⁹⁴ The value that wireless telephone service has created for consumers is truly staggering. One estimate suggests that consumers valued the first generation of cell phone service at \$50 billion per year.¹⁹⁵

Currently, approximately 170 MHz of radio spectrum are used for wireless service.¹⁹⁶ Some additional spectrum is currently unused because it was purchased when the FCC auctioned 120 MHz of spectrum for wireless in 1994, but the winning bidders went bankrupt and the spectrum was tied up in bankruptcy proceedings.¹⁹⁷ The FCC regained these licenses and reaucted them in early 2005.¹⁹⁸

Various FCC reports have identified between 183 and 438 MHz of unused or little-used spectrum that could be reallocated for mobile phone, fixed wireless telephony, and wireless broadband.¹⁹⁹ Even the larger figure represents only 23% of the most valuable spectrum.²⁰⁰ A 2004 study estimates the effect on consumer welfare of reallocating up to 200 MHz of that spectrum to mobile phone service.²⁰¹ Industry sources have suggested that 200 MHz would be needed to complete nationwide rollout of "third generation" wireless services.²⁰² The per-minute price of wireless service would fall by 50%, generating an increase in consumer welfare of \$77.4 billion per year.²⁰³

192. *Id.* at 103.

193. *Id.*

194. ROBERT W. CRANDALL & JERRY ELLIG, TEXAS PUBLIC POLICY FOUNDATION, TEXAS TELECOMMUNICATIONS: EVERYTHING'S DYNAMIC EXCEPT THE PRICING 10 (2005), <http://www.texaspolicy.com/pdf/2005-01-telecom.pdf>.

195. See Hausman, *supra* note 15, at 2.

196. See Thomas W. Hazlett et al., U.S. CHAMBER OF COMM., SENDING THE RIGHT SIGNALS: PROMOTING COMPETITION THROUGH TELECOMMUNICATIONS REFORM 69 (2004), http://www.uschamber.com/NR/rdonlyres/et3cydgjplrxcg7goxb5tlflazo2tw5ghhyplt7cu6wooge3bcnpqzx4bjeqb7ws5xqmgohikgclahl77gydqmnvb/0410_telecommstudy.pdf.

197. Hazlett et al., *supra* note 177, at 122–24.

198. For full information on "Auction 58," as this auction is known at the FCC, see http://wireless.fcc.gov/auctions/default.htm?job=auCTION_summary&id=58.

199. See Kwerel & Williams, *supra* note 186.

200. See *id.*

201. See Hazlett et al., *supra* note 196, at 69.

202. *Id.* at 100.

203. *Id.* at 69.

From the data and results in this study, one can also calculate the separate effects on consumers and producers. A 50% price reduction would save consumers approximately \$54 billion on the amount of wireless service they used in 2003.²⁰⁴ Consumers would gain an additional \$23.4 billion from the increased wireless usage that would accompany the price reduction.²⁰⁵ The increased usage would also increase wireless firms' profits by about \$6.6 billion, for a total increase in economic welfare, or reduction in excess burden, of \$30 billion.²⁰⁶ Many wireless firms would, however, be worse off if more spectrum were allocated to wireless for two reasons. First, \$54 billion of the reduction in consumers' bills would come out of wireless firms' revenues.²⁰⁷ Second, since the new licenses would be auctioned, wireless firms would pay some of their \$6.6 billion in expected new revenues to the U.S. Treasury. The firms most likely to gain from more liberal spectrum allocation would be new entrants or incumbents that need more spectrum to expand services. This may explain why liberalization has been slow in coming despite the enormous consumer benefits.

All of these figures are based on an international statistical analysis which estimates the elasticity of demand for wireless service of between -1.71 and -3.62.²⁰⁸ This range exceeds the most recent measures of the elasticity calculated using U.S. data, which range between -1.12 and -1.29.²⁰⁹ The larger elasticity based on the international data leads to a larger predicted change in consumer welfare when prices fall. Even if the true change in consumer welfare is only half as large, that is still billions of dollars—much larger than the effects of many other telecommunications regulations.

The foregoing estimate involves only 200 MHz of spectrum and assumes it would be used for wireless telephony. Several hundred more MHz are likely available, and these could also be used for broadband or for fixed wireless to provide the "last mile" of local telephone service. Unfortunately, no estimates of the impact of such increases in competition or consumer welfare are available.

The costs of current spectrum allocation policy can be expected to fall sometime after 2006 if the FCC carries through on its plan to auction an additional 90 MHz of spectrum in that year.²¹⁰ More fundamentally, the

204. For calculation methods and data sources see *infra* note 301.

205. *Id.*

206. *Id.*

207. *Id.*

208. HAZLETT & MUÑOZ, *supra* note 72, at 15.

209. See Sidak, *supra* note 71, at 19.

210. See Public Notice, FCC, FCC to Commence Spectrum Auction that will Provide

multi-billion dollar figure cited above should only be taken as a rough approximation of the negative effect of spectrum allocation policy on consumer welfare. A truly market-based approach would allow market transactions to allocate spectrum rather than licenses. Potential users could buy or lease spectrum, then choose how to use it. The amount of spectrum allocated to wireless telephone, broadcasting, broadband, and other services would be determined by market transactions and decisions of users, rather than by regulatory proceedings. As Ronald Coase noted in 1959:

Certainly, it is not clear why we should have to rely on the Federal Communications Commission rather than the ordinary pricing mechanism to decide whether a particular frequency should be used by the police, or for a radiotelephone, or for a taxi service, or for an oil company for geophysical exploration, or by a motion-picture company to keep in touch with its film stars or for a broadcasting station. Indeed, the multiplicity of these varied uses would suggest that the advantages to be derived from relying on the pricing mechanism would be especially great in this case.²¹¹

The FCC's mid-2004 decision regarding 190 MHz of spectrum allocated for use by educational institutions and wireless cable illustrates the difference.²¹² On the one hand, the decision gives license holders greater flexibility in leasing spectrum to others and expanding new uses, such as wireless broadband.²¹³ These are positive steps. On the other hand, the decision still provides that this spectrum can only be used for the range of purposes the FCC specifies, and the decision reshuffles allocations of frequencies within the range in an attempt to ensure that adjacent spectrum can be utilized efficiently.²¹⁴ The latter provisions would be unnecessary if license holders were actually spectrum owners. Owners could either decide how to use their spectrum or sell it to someone else, and the efficient reallocations that the FCC seeks to achieve through administrative procedures would occur through market transactions.

Under market-based allocation, the FCC, a court, or another

American Consumers New Wireless Broadband Services (Dec. 29, 2004) (auctioning cannot occur until June 2006 because the Commercial Spectrum Enhancement Act of 2004 requires the FCC to notify the National Telecommunications and Information Administration at least 18 months prior to the auction of any frequencies mentioned in the legislation so that any public sector users can be relocated to other spectrum), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-255802A1.pdf [hereinafter Spectrum Auction Public Notice].

211. R. H. Coase, *The Federal Communications Commission*, 2 J.L. & ECON. 1, 16 (1959).

212. See Amendment of Parts 1, 21, 73, 74, and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, *Report and Order and Further Notice of Proposed Rulemaking*, 19 F.C.C.R. 14165 (2004).

213. *Id.* para. 6.

214. *Id.*

government body would still have a significant role in preventing signal interference, but they would not decide which bits of spectrum could be used for which purposes. In theory, an accurate measure of the effects of spectrum policy would compare the effects of current allocations to the effects of the allocations that a competitive market might be expected to produce.

2. Outcomes

The FCC's strategic goal for spectrum is to "[f]acilitate the highest and best use of spectrum domestically and internationally to promote the growth and rapid deployment of innovative and efficient communications technologies and services."²¹⁵ Performance goals focus on efficient and effective use of spectrum, deployment of new technologies and services, and promotion of ease of access to spectrum by more users.²¹⁶ The FCC's *Report* offers two outcome indicators. The first, increasing the number of approvals for enhanced telecommunications equipment, is actually an output measure, but the *Report* argues this is a leading indicator of new devices on their way to the market.²¹⁷ The data indicate that, while the FCC made about as many new equipment authorizations in 2004 as in 2003, certification bodies approved by the FCC made about 900 more authorizations in 2004 than in 2003, an 18% increase.²¹⁸ The second indicator, facilitating deployment of new or existing services that make efficient use of spectrum, could be characterized as an outcome, but the accompanying text principally outlines ongoing changes in FCC policies and procedures that the FCC believes will lead to more flexible use of spectrum for new technologies and services, avoid signal interference, encourage "intense and efficient" spectrum use, award licenses as rapidly as possible, and ensure that licensees actually use the spectrum in a timely fashion.²¹⁹ The *Report* describes a large number of activities and initiatives but does not indicate whether the listed outcomes for the public have actually been achieved.²²⁰

In the past, having the FCC allocate spectrum to various uses was purported to advance several policy outcomes. These included promotion of the "public interest," promotion of consumer welfare, and prevention of signal interference when different parties try to use the same frequency at

215. *Report*, *supra* note 20, at 11.

216. *Id.*

217. *Id.* at 38.

218. *Id.* at 40.

219. *Id.*

220. *Id.* at 40–41.

the same time.

At least in the FCC context, the “public interest” implies no specific outcome. A number of FCC chairmen, general counsels, and legal experts have noted that the “public interest” standard means precisely what its author, Senator C. C. Dill, said it meant: “It covers just about everything.”²²¹ Thus, the public interest standard is too broad to provide a definition of specific outcomes that FCC spectrum allocation policy might be intended to affect.

Another possible outcome is promotion of consumer welfare, as opposed to the welfare of the regulated industry. However, the research cited above suggests that FCC spectrum allocation often reduces consumer welfare by reducing competition.²²² Consumers benefit when license holders have more flexibility to choose which services they will offer, which technologies they will employ, and which business model they will follow. The more flexibility license holders have to use spectrum as they see fit, the more competitive are the markets for services that use the spectrum. Consumers receive more service at lower prices, and license holders pay less for licenses because restrictions on the uses of spectrum no longer protect license holders from competition. Empirical research using data from more than 1,400 license auctions in 27 countries finds that liberal policies allowing license holders to determine services, technologies, and business models reduce the price paid for licenses by 38%.²²³ A more liberal spectrum regime is also associated with lower retail prices for wireless service.²²⁴

The classic argument for government ownership of the airwaves, and administrative allocation of licenses to use spectrum, was that regulation is needed to prevent interference between parties attempting to use the same frequency.²²⁵ A “chaotic” period in 1926, when 200 new radio stations were established and operators used any power or frequencies they desired, is often cited as proof.²²⁶ However, the chaos during that period resulted from courts interpreting the 1912 Radio Act to prevent the Commerce Department from issuing exclusive licenses for particular wavelengths in

221. See Hazlett et al., *supra* note 177, at 43; HAZLETT & MUÑOZ, *supra* note 72.

222. See Hazlett et al., *supra* note 177.

223. See Thomas W. Hazlett, *Property Rights and Wireless License Values 4* (AEI-Brookings Joint Center for Regulatory Studies, Working Paper No. 04-08, 2004), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=519602. Four countries—Australia, New Zealand, Guatemala, and El Salvador—leave these decisions to the license holder rather than the regulator. *Id.*

224. *Id.* at 25.

225. Hazlett et al., *supra* note 177, at 19.

226. See *e.g.*, Coase, *supra* note 211, at 5.

order to prevent interference.²²⁷ The problem during that period was the absence of *any* method for preventing interference in the use of frequencies. The 1927 Act establishing the Federal Radio Commission allowed the Commission to prevent interference, but also gave it the discretion to award licenses only when the “public interest, necessity, or convenience would be served” and prohibited licensees from asserting any ownership claim over the airwaves.²²⁸ Regulators could prevent interference by issuing licenses to use particular frequencies without specifying how much of which frequency bands must be devoted to which types of services. Therefore, avoiding interference cannot be an outcome attributed to spectrum *allocation*.

H. *Satellite*

The FCC licenses non-defense satellites for a variety of purposes, including television broadcasting, subscription television, radio, telephone, Internet, and various private communications. Satellites can be either geostationary, which remain in a fixed position above the earth, or non-geostationary, which travel around the earth on a fixed path. The FCC licenses the spectrum that satellites use to communicate with transmitters and receivers on earth. In addition, a satellite owner who wants to use an orbital slot or path allocated to the United States by international agreement must obtain an FCC license. In practice, the satellite operator’s license specifies both the satellite’s location and the communications spectrum it uses.

FCC decisions thus affect the supply of and competition in satellite services. For example, the FCC recently issued a Public Notice seeking comment on proposals to allow geostationary direct broadcast satellites, the type used to provide consumers with television and broadband Internet service, to be spaced more closely than nine degrees apart.²²⁹ If regulators find this proposal feasible and adopt it, substantially more satellite capacity could be available for television and broadband Internet service.

When awarding certain types of satellite licenses, federal regulators are constrained by a provision of the legislation that privatized Intelsat and Inmarsat. The Act explicitly states:

Notwithstanding any other provision of law, the Commission shall not have the authority to assign by competitive bidding orbital locations or spectrum used for the provision of international or global satellite

227. *Id.* at 4–5.

228. *Id.* at 6 (citations omitted).

229. See Public Notice, FCC, International Bureau Seeks Public Comment on Proposals to Permit Reducing Orbital Spacings Between U.S. Direct Broadcast Satellites, 18 F.C.C.R. 25683 (2003).

communications services. The President shall oppose in the International Telecommunication Union and in other bilateral and multilateral fora any assignment by competitive bidding of orbital locations or spectrum used for the provision of such services.²³⁰

The *Report* mentions several satellite-related projects and initiatives but offers no outcome goals or measures focused specifically on satellites.²³¹ No studies assess the effects of the law or FCC satellite regulations on competition in broadband service or telephone service. Satellite telephone service is much more expensive than wireless phone service, but an increase in satellite capacity for television and broadband could spur telephone competition in several indirect ways. More intense video competition from satellite-based providers could prompt greater packaging of satellite video with landline telephone service. In addition, widely available and inexpensive satellite broadband service could give consumers, especially rural consumers, another conduit for Internet telephony.

I. *Unbundled Network Elements*

The Telecommunications Act of 1996 requires incumbent telephone companies to lease parts of their networks, “unbundled network elements,” to competitors at regulated rates.²³² The most obvious example of a network element might be the local “loop,” the wire that connects a home or business to a switch located in the phone company’s central office.²³³ A competitor leasing only local loops would install its own switches in the incumbent’s central office and make its own arrangements to transport calls between its switches. In addition to individual network elements, the FCC also required incumbents to lease the entire set of network elements necessary to provide local service, the “unbundled network element platform.”²³⁴ Leasing the unbundled network element platform is equivalent to buying the incumbent’s service at a wholesale discount. In December 2004, the FCC effectively decided to stop forcing incumbents to lease the unbundled network element platform to competitors after a one-

230. 47 U.S.C. § 765(f) (2000).

231. See generally *Report*, *supra* note 20.

232. 47 U.S.C. § 251(c)(3) (2000).

233. Jerry Ellig & James Nicholas Taylor, *The Opportunity Costs of Unbundled Network Element Platform Regulation 2* (Mercatus Center, Working Paper, 2004), available at <http://www.mercatus.org/pdf/materials/980.pdf>.

234. Unbundled Access to Network Elements, Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Order on Remand*, 20 F.C.C.R. 2533 (2005) at note 526. [hereinafter Unbundling Obligations]. The unbundled network element platform has generated substantial debate. For a more detailed discussion, see Ellig & Taylor, *supra* note 233.

year transition period.²³⁵ If the new rules are upheld, the platform would be phased out over one year.

Prices for network elements, determined by state commissions, are based on a method called Total Element Long Run Incremental Cost (“TELRIC”) pricing. TELRIC pricing is based not on the incumbent firm’s actual historical costs, but rather on regulators’ estimate of the costs that would be borne today by a hypothetical firm building the most efficient network regulators believe is possible.²³⁶ Proceedings to calculate TELRIC prices have generated significant disagreement.²³⁷

Unbundling affects both consumer and business telecommunications services. Most studies focus on unbundling as it relates to ordinary telephone service for residential and small business customers.²³⁸ Price and quantity data for more complex services to businesses, or service to large businesses, are often confidential.

1. Costs

The Telecommunications Act mandated wealth transfers from the incumbents. These transfers create some unusual types of costs due to the structure of telecommunications regulation. The purpose of unbundling is to encourage competition in local telephone service. Local residential service, however, has traditionally been priced below cost.²³⁹ By regulating the price that incumbent telephone companies charge for network elements, regulators seek to encourage competition, and hence lower prices, for some services that are already sold below cost.²⁴⁰ And by mandating price reductions for unbundled network elements, policymakers forego the opportunity to reduce the prices of services that have traditionally been “taxed,” such as long distance and wireless, in order to subsidize local service.²⁴¹ In other words, instead of trying to reduce the price of local service, policymakers could have reduced long-distance access charges or universal service contributions from long distance or wireless. The price reductions and increases in economic welfare that could have been created

235. See generally Unbundling Obligations, *supra* note 234, paras. 199–219.

236. See Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, *Report and Order and Order on Remand and Further Notice of Proposed Rulemaking*, 18 F.C.C.R. 16978, para. 669 (2003) [hereinafter Review of Section 251].

237. See *id.* para. 675. In 2003 the FCC began a proceeding to reconsider how the TELRIC pricing methodology deals with the firm’s cost of capital and depreciation. *Id.*

238. See Ellig & Taylor, *supra* note 233.

239. See CRANDALL & WAVERMAN, *supra* note 6, at 9–10.

240. Ellig & Taylor, *supra* note 233.

241. See CRANDALL & WAVERMAN, *supra* note 6, at 20–21.

through these alternative policies are the opportunity cost of unbundled network element regulation. These opportunity costs should be weighed against benefits to determine whether consumers and society are better or worse off.

In a recent book, Robert Crandall examines the effects of the Telecommunications Act's unbundling provisions.²⁴² Using rather generous assumptions, he estimates that in 2003 unbundling may have transferred approximately \$1.3 billion from incumbent phone companies to residential and small business consumers and \$8.4 billion to large business customers, for a total of \$9.7 billion.²⁴³ These benefits come at an opportunity cost. Instead of transferring the money to consumers by mandating low unbundled network element prices, regulators could have reduced access charges and universal service contributions from long-distance and wireless carriers. A \$9.7 billion reduction in these charges would generate a \$1.4 billion increase in consumer surplus, for a total gain to consumers of \$11.1 billion.²⁴⁴ Overall economic welfare would have increased by \$5.9 billion.²⁴⁵ Thus, the opportunity costs of unbundling have been substantial, and they should be weighed against any savings consumers received.

For purposes of regulatory accounting, it is necessary to determine whether these opportunity costs are new, or if they are already incorporated in previous estimates of the effects of access charges and universal service funding. If platform regulation merely redistributes the incumbent's monopoly profits, or forces a reduction in excessive costs, then no additional cross-subsidies are required to allow the incumbent to maintain the local telephone network. Platform regulation still entails an opportunity cost because there are more efficient ways of redistributing that wealth to consumers. However, this opportunity cost would already be captured in estimates of the consumer welfare cost of existing cross-subsidy

242. ROBERT W. CRANDALL, BROOKINGS INST., *COMPETITION AND CHAOS: U.S. TELECOMMUNICATIONS SINCE THE 1996 TELECOM ACT*, (2005).

243. *Id.* at 54, 56.

244. For calculation methods and data sources see *infra* note 302.

245. *Id.* The calculations assume that unbundling resulted in a dollar-for-dollar transfer from incumbent phone companies to consumers. Ellig & Taylor, however, found that for every dollar transferred from the incumbent, less than a dollar reaches consumers. Therefore, the actual amount of money transferred from incumbents likely exceeds \$9.7 billion, and the opportunity cost in terms of forgone consumer and producer surplus would be concomitantly larger. Actual interstate access and universal service charges may currently be less than \$9.7 billion. However, there is still room to reduce these kinds of charges by that amount. States also impose access and universal service charges on intrastate long-distance and wireless service, and intrastate long-distance access charges per minute are typically higher than federal charges. See Ellig & Taylor, *supra* note 233. See generally CRANDALL & ELLIG, *supra* note 194 (analyzing intrastate issues).

schemes.²⁴⁶

Suppose, on the other hand, the incumbent was operating efficiently and earning no monopoly profits. In that case, the wealth transfer caused by platform regulation would have to be replaced by additional cross-subsidies if the incumbent is expected to maintain the local telephone network. These additional cross-subsidies would create additional reductions in consumer welfare, on top of those created by previously existing cross-subsidies. In this case, the opportunity cost of platform regulation would be added to the existing costs of cross-subsidies.

A final possibility is that the incumbent had some monopoly profits or excess costs, but the size of the wealth transfer from platform regulation exceeds these. In that case, some of the opportunity cost of platform regulation would already be reflected in the costs of existing cross-subsidies, and some of the opportunity cost would correspond to additional cross-subsidies needed to ensure that the incumbent can maintain the network. Only a portion of the opportunity cost would be added to the other costs of telecommunications regulation.

The bulk of published academic research suggests that TELRIC prices calculated with FCC cost models are 19–67% below competitive levels, depending on the specific network element.²⁴⁷ These results imply that the platform prices mandated by state regulators are also likely below competitive levels, though it is not clear how much below. Therefore, at least some of the opportunity cost calculated above is likely a new cost, in addition to previously estimated inefficiencies of access charges and universal service policies.

2. Outcomes

The desirable outcomes associated with unbundling would be increased competition and, ultimately, the lower prices or other consumer benefits that competition traditionally brings. The FCC's *Report* shows data on trends in the telecommunications consumer price index and on the percentage of households with access to three or more wireline telecommunications providers.²⁴⁸ By these measures, competition has increased and prices have fallen over the past several years.²⁴⁹ The *Report* does not offer evidence of a causal link between the FCC's unbundling policies and these favorable trends.

246. For discussion, see Part IV.B & C, *supra*, on Long-Distance Access Charges and Universal Service Funding, respectively.

247. See Ellig & Taylor, *supra* note 233.

248. *Report*, *supra* note 20, at 32–33.

249. *Id.*

FCC statistics reported elsewhere show that the number of lines served by competitors using unbundled network elements rose from about 2 million in 1999 to almost 19 million in June 2004.²⁵⁰ These lines accounted for 61% of all competitors' lines in 2004.²⁵¹ As the number of lines served with unbundled network elements rose significantly, the number served by non-cable competitors using their own facilities rose by only 1 million between 2000 and 2004.²⁵² Facilities-based lines fell from 33% of competitors' lines in 1999 to 23% in June 2004.²⁵³ The remaining 16% of competitors' lines are resold pursuant to other provisions of the Telecommunications Act, discussed *infra*, Part IV.J.

Most of the available empirical studies suggest that unbundling has largely led to a substitution of one type of competition for another. Crandall, Ingraham, and Singer examined the effect of regulated rates for unbundled loops, the wires that connect individual customers with telephone company switching facilities.²⁵⁴ Loops are arguably the most likely network element to be a natural monopoly. They found that regulated loop prices prompt competitors to lease loops rather than build their own.²⁵⁵

Employing 1997–2000 data from markets where the Bell companies are the incumbents, Eisner and Lehman found that lower unbundled network element prices do *not* increase the number of lines served by competitors using unbundled network elements, but they decrease facilities-based entry.²⁵⁶ Section 271 approval, which indicates that regulators believe the Bell incumbent has unbundled sufficiently to open the local market to competition, is associated with a 260,000–336,000 increase in lines served by competitors using unbundled network elements.²⁵⁷ Since the incumbents are Bell companies and Section 271 proceedings tended to reduce unbundled network element rates, this variable may be picking up the effects of unbundled network element pricing. Lower residential rates are often associated with less facilities-based competitive entry, but lower business rates are not a logical finding given that business rates are usually higher than residential rates.²⁵⁸

250. See LOCAL TELEPHONE COMPETITION, *supra* note 148, at tbl. 3.

251. *Id.*

252. For calculation of data, see *id.* at tbls. 3, 5.

253. *Id.* at tbl. 3.

254. See Robert W. Crandall et al., *Do Unbundling Policies Discourage CLEC Facilities-Based Investment?*, 4 TOPICS IN ECON. ANALYSIS & POL'Y 1136 (2004).

255. *Id.* at 1138.

256. See James Eisner & Dale E. Lehman, Presentation at the 14th Annual Conference Center for Research in Regulated Industries: Regulatory Behavior and Competitive Entry B3 (June 28, 2001), <http://www.aestudies.com/library/elpaper.pdf>.

257. *Id.*

258. *Id.*

Analyzing data from 1998–2000, Crandall found that competitors whose revenues per dollar of assets grew the fastest were those that built their own networks, not those that relied on unbundled network elements.²⁵⁹ There was no difference in performance between competitors targeting business or residential customers.²⁶⁰ Competitors using a mixed strategy of leasing some network elements and building some of their own network did better than those that relied wholly on unbundled network elements, but worse than those using their own network entirely.²⁶¹ This result may occur because the typical competitor seeks to offer local telephone service in combination with other services, such as long distance, Internet, high-speed data connection, or video. A competitor building its own network can offer a wider array of services, using newer technology, than one relying heavily on the incumbent's older network, which was originally designed to carry voice traffic only. These results do not mean that a competitor that failed to invest in its own network could not be successful. The results simply mean that those firms that did not invest in their own facilities were less likely to succeed. The existing research on competition suggests that unbundled network element regulation encourages entrants to use unbundled network elements, but discourages them from building their own facilities.

A small number of studies examine the direct impact of unbundling on prices or other variables of interest to consumers.²⁶² It is doubtful that unbundling has reduced the price of basic local telephone service.²⁶³

Crandall offers the most recent comprehensive estimate of the benefits of unbundling. He argues that the previously cited \$1.3 billion in savings for residential and small business customers generates no increase in use of local service by these customers since their demand is very inelastic.²⁶⁴ Because large business demand may be more responsive to price changes, Crandall estimates that the \$8.4 billion in price reductions to large business generates an additional \$800 million in consumer surplus due to increased usage.²⁶⁵ Thus, the total benefits of unbundling to telecommunications users total \$10.5 billion.²⁶⁶

259. See generally Robert W. Crandall, *An Assessment of the Competitive Local Exchange Carriers Five Years after the Passage of the Telecommunications Act*, CRITERION ECONOMICS, Jan. 2002, <http://www.criterioneconomics.com/docs/Crandall%20CLEC.pdf>.

260. *Id.* at 41–42.

261. *Id.* at 41.

262. See Crandall, *supra* note 242, at 44; Ellig & Taylor, *supra* note 233.

263. See Crandall, *supra* note 242, at 44; Ellig & Taylor, *supra* note 233.

264. Crandall, *supra* note 242, at 54.

265. *Id.* at 56.

266. *Id.* at 56.

These benefits are less than the \$11.1 billion opportunity cost to consumers calculated in Part IV.J.1, *supra*. They are also less than the expenditures incurred by competitive local telephone companies to produce the benefits. Crandall conservatively estimates the competitors' capital costs at \$8 billion annually, and his data suggest that their selling, general, and administrative costs would total about \$8.9 billion annually, for a total of \$16.9 billion.²⁶⁷ Unbundling required the nation to spend \$1.74 to transfer each dollar to consumers, and \$21 to produce a dollar's worth of consumer surplus.²⁶⁸

Several other studies published by various think tanks or coalitions, and several working papers on Web sites, estimate consumer savings or consumer benefits for particular states or segments of consumers.²⁶⁹ These consumer benefits, however, are smaller than the consumer benefits that would result if regulators had simply reduced long-distance access charges or universal service contributions. The latter policy is superior for two reasons. First, it involves a direct wealth transfer from incumbent phone companies to consumers, thus ensuring that consumers actually receive all of the wealth that is transferred from incumbents. Under platform regulation, consumers receive only a fraction of the wealth that gets transferred from incumbents. The direct transfers also generate larger increases in consumer welfare as a result of lower long-distance prices. The net result is that platform regulation actually reduces consumer welfare, compared to what would occur if the wealth transfer were accomplished through a reduction in long-distance access charges.

Competition often offers nonprice benefits, such as innovative new services, but such benefits are unlikely to occur under platform regulation. Since competitors leasing the platform do not build their own local facilities, platform regulation offers them no opportunity to offer local services different from those offered by the incumbent. In theory, platform regulation might eventually open the door to innovative new services if competitors use the platform as a transitional strategy to enter the market before building their own facilities. In practice, empirical research shows that platform regulation has precisely the opposite effect because it serves as a substitute for facilities-based competition. Either the "transition" theory is wrong, or platform regulation was not given enough time to work.

267. *Id.* at 54–56 (reporting that competitive local exchange carriers received \$17.7 billion in revenues in 2003, and industry analysts estimate that they spent about half their revenues on selling, general, and administrative expenses).

268. \$16.9 billion in costs divided by \$9.7 billion transferred to consumers equals \$1.74 per dollar transferred \$16.9 billion in costs divided by \$800 million in consumer surplus equals \$21 per dollar of consumer surplus.

269. See Ellig & Taylor, *supra* note 233 (discussing the limitations of these studies).

J. Resale of Incumbent's Services

Resale is provided for in section 251(c)(4) of the Telecommunications Act.²⁷⁰ Subpart (A) declares that it is the duty of incumbent local phone companies "to offer for resale at wholesale rates any telecommunications service that the carrier provides at retail to subscribers who are not telecommunications carriers"²⁷¹ Subpart (B) states that incumbents are "not to prohibit, and not to impose unreasonable or discriminatory conditions or limitations on, the resale of such telecommunications service"²⁷² Subsection (3) of Part (d) deals with wholesale pricing:

For the purposes of section 251(c)(4) of this title, a State commission shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier.²⁷³

There was precedent for the Telecommunications Act's resale provisions. A similar policy, adopted to open the long-distance market to competition from firms like Sprint and MCI in the 1980s, seemed to work well.²⁷⁴ In the local market, however, few competitors now seem to regard resale as the preferred business strategy. AT&T, for example, found within a year after passage of the Telecommunications Act that offering local service through resale was unprofitable, despite a wholesale discount of approximately 17%.²⁷⁵ In most cases, regulated wholesale discounts have averaged between 15 and 25%.²⁷⁶

1. Costs

No studies have directly estimated the costs or benefits of resale. To do so, one would need to compare actual, regulated wholesale prices with economically efficient wholesale prices. An efficient wholesale price would provide a discount equal to the costs that the incumbent actually avoids by selling at wholesale. One can calculate a rough estimate of the "opportunity costs" of resale in a manner similar to the calculation of the opportunity costs of unbundled network elements.

The policy redistributed between \$4.5 million and \$21 million from

270. 47 U.S.C. § 251(c)(4) (2000).

271. § 251(c)(4)(A).

272. § 251(c)(4)(B).

273. 47 U.S.C. § 252(d)(3) (2000).

274. See, e.g., Yale M. Braunstein, *UNE-P Benefits in Verizon's New Jersey Territory* (Mar. 2004) (unpublished manuscript, University of California, Berkeley), http://sims.berkeley.edu/~bigyale/UNE/UCB_NJ_UNE_study_Mar_2004.pdf.

275. See Crandall, *supra* note 259, at 32.

276. Crandall & Hausman, *supra* note 190, at 84.

incumbents to competitors in 2004.²⁷⁷ If this money were used to reduce long-distance access charges, it would create approximately that size increase in consumer welfare and a \$7.5–35 million increase in social welfare.²⁷⁸

2. Outcomes

Resale might be expected to generate several pro-competitive outcomes. First, competitors could combine the incumbent's local service with their own unique services, such as long distance, to offer a package better than the incumbent's. Second, competitors might use resale as a transitional strategy to build market share before undertaking the expense of building their own local facilities.

A few studies have assessed the causes and consequences of resale. They suggest that resale is unlikely to produce these benefits because it has not turned out to be a very effective business strategy. Employing 1991–2000 data from markets where the Bell companies are the incumbents, Eisner and Lehman found no statistically significant relationship between the size of wholesale discounts and the number of lines served by competitors via resale.²⁷⁹ This finding is consistent with the theory that resale discounts have not been large enough to make resale profitable. Using 1998–2000 data, Crandall found that competitors relying on resale had only average revenue growth per dollar of capital assets, a finding that does not bode well considering that competitors' "average" financial performance has not been very good.²⁸⁰

Reports that incumbent carriers file with the FCC indicate that there were 1.7 million resold lines in December 1997, rising to a peak of 5.4 million in December 2000 before falling back to 1.6 million in June 2004.²⁸¹ Competitors' numbers are somewhat different; they reported acquiring 3.5 million resold lines in December 1999, rising to 5.1 million in June 2004.²⁸² Despite the disparity in numbers, the competitors' figures suggest that resale has become less popular, as the percentage of their lines accounted for by resale fell steadily from 42.9% in December 1999 to 16.1% in June 2004.²⁸³

One explanation is that wholesale discounts are not large enough to

277. For calculation method and data sources see note 303, *infra*.

278. *See id.*

279. *See* Eisner & Lehman, *supra* note 256, at B2–B3.

280. *See* Crandall, *supra* note 254, at 4–5.

281. *See* LOCAL TELEPHONE COMPETITION, *supra* note 148, at tbl. 4.

282. *Id.* at tbl. 3.

283. *Id.*

permit effective competition against the incumbent's local rates, which are often below incremental cost because they benefit from cross-subsidies. Another possibility is that the unbundled network element platform's regulated prices, which are equivalent to wholesale discounts of more than 45%, have made unbundling more attractive than resale from the perspective of competitors.²⁸⁴ A final explanation is that resale forces the competitor to offer a service identical to that offered by the incumbent. The most successful competitors, however, have developed their own networks that can offer innovative new services, or at least better service.²⁸⁵ Therefore, resale is not a very attractive option for these competitors. A competitor can *market* resold services along with its own, such as long-distance service, but resale offers no cost or quality advantages from *producing* services using a different type of network. Crandall concludes, "Just changing the nameplate on the service is not typically a very good strategy for attracting customers."²⁸⁶

V. CONCLUSION

Federal telecommunications regulation costs consumers at least \$25 billion annually in forgone consumer surplus, or as much as \$100 billion if one includes the wealth transfers as a cost to consumers.²⁸⁷ Total deadweight loss is approximately \$42 billion annually. If all of the wealth transfer is counted as a cost, the total social cost is approximately \$118 billion annually.

The costs associated with federal telecommunications regulation far exceed the FCC's estimated expenditures in fiscal year 2004. The cost of regulation to consumers is more than 60 times this amount, and the cost excluding spectrum management is more than 15 times the cost of FCC regulatory spending.

Aside from the total costs, a truly remarkable finding is the percentage accounted for by federal spectrum allocation policies. Although the FCC has tried to increase the flexibility of spectrum allocation policy in recent years, it remains true that regulators, rather than market transactions, determine how broad swaths of spectrum will be used. Even if the \$77 billion figure overestimates the consumer benefits from making an additional 200 MHz of spectrum available, it suggests that the benefits

284. See Robert S. Pindyck, *Mandatory Unbundling and Irreversible Investment in Telecom Networks 7* (Verizon Communications, Inc., Working Paper No. 10,287, 2004), <http://web.mit.edu/rpindyck/www/VZ.UNE.Pindyck0104.pdf>.

285. See Crandall, *supra* note 254, at 23–32.

286. *Id.* at 42.

287. The total figures are sums of the costs of individual regulations; thus, they ignore any interactions between regulations. See Table 2, *infra*.

from wholesale overhaul of spectrum policy would be huge. If the actual costs of U.S. spectrum allocation policy were only one-tenth the size that scholars estimate, they would still account for more than 20% of the total consumer cost of federal telecommunications regulation.²⁸⁸

Federal telecommunications regulation redistributes wealth inefficiently. Economists often compare the efficiency of taxes and other policies by comparing the excess burdens as a percentage of the wealth transfers. The excess burden percentages in Table 2, *infra*, show how the efficiency of regulations compares to the efficiency of direct wealth transfers through taxation. In all but one case, these percentages exceed the 25–40% excess burden attributed to direct taxation. The one exception is wireline local number portability, which generates little inefficiency because it increases the price of a service with a very low elasticity of demand. The federal government could accomplish all of the other wealth transfers at lower total cost to society through general taxation. It could minimize the social cost by funding the transfers with flat-rate charges on local phone bills, similar to the federal subscriber line charge.

Two previously announced changes should substantially reduce some of the regulatory costs within a few years. The federal government's decision to auction an additional 90 MHz of spectrum for wireless communications in 2006, while a far cry from wholesale overhaul of spectrum policy, should, nevertheless, generate large consumer benefits.²⁸⁹ The FCC's decision to phase out the unbundled network element platform, if upheld, should also substantially reduce the amount of money redistributed via regulation and encourage facilities-based competition in local phone service.²⁹⁰ The effect of this decision on competition will ultimately depend on how Congress and the FCC treat emerging competitors, such as VoIP and wireless.

Research on outcomes is much less extensive than research on costs. One regulation, enhanced 911, has clear evidence of positive outcomes. Enhanced 911 significantly reduces both cardiac risk and hospital costs, and these benefits likely exceed the costs of the regulation.

Some regulations achieve positive outcomes, but not very effectively. There is some evidence that universal service programs may increase telephone subscriptions, but at a cost of thousands of dollars annually per additional subscriber. Regulations requiring incumbent local telephone

288. Jerry Ellig, *The Economic Cost of Spectrum Misallocation: Evidence from the United States* (June 9–10, 2005) (unpublished manuscript, on file with Author and the *Federal Communications Law Journal*).

289. See *Spectrum Auction Public Notice*, *supra* note 210.

290. See *generally* *Unbundling Obligations*, *supra* note 234.

companies to lease the local network to competitors transfer \$9.7 billion annually to consumers and businesses, but much less effectively than alternative policies. Such regulations also reduce competitors' investments in building their own networks, undermining the FCC's oft-articulated goal of encouraging facilities-based competition.

Many regulations have negligible effects on the outcomes they are intended to influence. These include interstate long-distance access charges, low-income universal service programs, high-cost universal service programs, spectrum allocation, and resale of incumbent local exchange carrier services.

For some regulations, outcomes are effectively unknown. No studies or data establish that the regulations have accomplished desired outcomes for the schools and libraries universal service program, local number portability, number pooling, satellite regulation, or CALEA for wireless communications.

The FCC's *Report* generally does a good job of identifying the outcomes regulators are trying to achieve. However, the *Report* fails to demonstrate how, or how much, existing regulation has contributed to those outcomes. Scholarly research occasionally fills this gap, but not frequently enough to provide a comprehensive understanding of all of the effects of telecommunications regulation.

Despite the gaps in knowledge, the empirical research on the effects of federal telecommunications regulation is impressive in its scope and sophistication. If such studies can help achieve even a small percentage reduction in regulatory costs or improvement in regulatory outcomes, the benefits to society will likely outweigh the costs of the data collection and research.

TABLE 2: COSTS OF FEDERAL TELECOMMUNICATIONS REGULATION

Regulation	Outlays or Wealth Transfer	Forgone		Total Cost to Consumers	Value of Forgone Output		Wealth transfer Plus Forgone Output		Excess Burden %	
		Consumer Surplus	Consumer		Output	Output	Output	Output		
FCC outlays 2004 ²⁹¹	\$361,000,000	N.A.	N.A.	N.A.	\$144,000,000	\$505,000,000			40	
FCC net cost of 3 strategic goals ²⁹²	\$1,200,000,000	N.A.	N.A.	N.A.	\$480,000,000	\$1,680,000,000			40	
Interstate Long-Distance										
Access Charges 2002 ²⁹³	\$3,300,000,000	\$300,000,000		\$3,600,000,000	\$1,450,000,000	\$4,750,000,000			44	
Universal Service Contributions										
Interstate long-distance 2002 ²⁹⁴	\$2,700,000,000	\$240,000,000		\$2,940,000,000	\$1,160,000,000	\$3,860,000,000			43	
Wireless 2004 ²⁹⁵	\$1,760,000,000	\$48,000,000		\$1,808,000,000	\$978,000,000	\$2,738,000,000			56	
International	N.A.	N.A.		N.A.	N.A.	N.A.			N.A.	
Local Number Portability										
Wireline 2003 ²⁹⁶	\$762,000,000	\$0		\$762,000,000	\$0	\$762,000,000			0	
Wireless 2004 ²⁹⁷	\$1,023,000,000	\$28,000,000		\$1,051,000,000	\$568,000,000	\$1,590,000,000			56	
Enhanced 911										
Wireline 2004	N.A.	N.A.		N.A.	N.A.	N.A.			N.A.	
Wireless 2004 ²⁹⁸	\$1,248,000,000	\$34,000,000		\$1,282,000,000	\$693,000,000	\$1,940,000,000			56	
Misc. Wireless										
Number pooling 2004 ²⁹⁹	\$348,000,000	\$9,500,000		\$357,500,000	\$193,000,000	\$541,000,000			56	
CALEA 2004 ³⁰⁰	\$491,000,000	\$13,000,000		\$504,000,000	\$273,000,000	\$764,000,000			56	

Spectrum allocation 2004 ³⁰¹	\$54,000,000,000	\$23,400,000,000	\$77,400,000,000	\$30,000,000,000	\$84,000,000,000	56
Telephone Unbundling						
Unbundled Net Elements 2003 ³⁰²	\$9,700,000,000	\$1,400,000,000	\$11,100,000,000	\$5,900,000,000	\$15,600,000,000	61
Resale 2003 ³⁰³	\$21,000,000	\$6,911	\$21,006,911	\$14,000,000	\$35,000,000	67
Total	\$76,553,000,000	\$25,472,506,911	\$100,825,506,911	\$41,709,000,000	\$118,262,000,000	
Total excluding FCC spending	\$75,353,000,000	\$25,472,506,911	\$100,825,506,911	\$41,229,000,000	\$116,582,000,000	
Total excluding spectrum and FCC spending	\$21,353,000,000	\$2,072,506,911	\$23,425,506,911	\$11,229,000,000	\$32,582,000,000	

Italicized figures in each column are the same because estimates for some items that would make them different are unavailable.

N.A. = Not available.

291. Outlays: See DUDLEY & WARREN, *supra* note 23. Value of forgone output: Assumes each dollar of outlay generated an excess burden of \$0.40. See Hausman, *supra* note 24, at 17 tbl. A-1. Excess burden percentage is from Hausman. *Id.* at 740.

292. Outlays: Report, *supra* note 20, at 115. Value of forgone output: Assumes each dollar of outlay generated an excess burden of \$0.40 and excess burden percentage is from Hausman, *supra* note 24.

293. Wealth transfer: \$0.01 per minute access charge times 333.8 billion interstate domestic long-distance minutes. LANDE & LYNCH, *supra* note 38. Forgone consumer surplus: Calculated assuming price of \$0.07 per minute and demand elasticity of -0.7. See *id.* Elasticity estimate: Riordan, *supra* note 31, at 436. Value of forgone output: Assumes marginal cost equals .25-p. See Hausman & Shelanski, *supra* note 17, at 42. To accurately measure the effect of access charges in a study that measures the impact of all regulatory charges added to the cost of long-distance service, one must calculate the changes in consumer and producer welfare caused by access charges and federal universal service contributions together, then allocate the amounts to access charges and universal service contributions in proportion to their share of the total price change. Excess burden percentage is value of forgone output divided by wealth transfer.

294. Wealth transfer: Universal service contribution of \$0.08 per conversation minute multiplied by 333.8 billion interstate domestic conversation minutes. LANDE & LYNCH, *supra* note 38. Universal service contribution per interstate domestic conversation minute calculated by subtracting \$0.01 access cost per interstate conversation minute in 2002 from \$0.018 total access and universal service contribution per interstate domestic conversation minute in 2002. Forgone consumer surplus: Calculated assuming price of \$0.07 per minute and demand elasticity of -0.7. These data are derived from LANDE & LYNCH, *supra* note 38. Elasticity estimate: Riordan, *supra* note 31, at 436. Value of forgone output: Assumes marginal cost equals .25-p. See Hausman & Shelanski, *supra* note 17. To accurately measure the effect of universal service charges in a study that measures the impact of all regulatory charges added to the cost of long-distance service, one must calculate the changes in consumer and producer welfare caused by access charges and federal universal service contributions together, then allocate the amounts to access charges and universal service contributions in proportion to their share of the total price change. Excess burden percentage is value of forgone output divided by wealth transfer.

295. TRENDS IN TELEPHONE SERVICE, *supra* note 60, at 19-4 tbl. 19.1. Figure calculated by multiplying total universal service outlays in tbl. 19.1 (\$5.4 billion) by the percentage of contributions from wireless service providers in tbl. 19.15 (32.6%). Forgone consumer surplus: Calculated assuming price of \$0.092 per minute and demand elasticity of -1.12. Tenth Report, *supra* note 131, at tbls. 1, 9. Elasticity estimate: Sidak, *supra* note 71, at 22. Value of forgone output: Assumes marginal cost equals \$0.05 per minute. See Hausman, *supra* note 24, at 737. To accurately measure the effect of multiple mandates in a study that measures the impact of all regulatory charges added to the cost of wireless service, one must calculate the changes in consumer and producer welfare caused by five regulatory mandates on wireless together: universal service, local number portability, number pooling, Enhanced-911, and CALEA. Then one allocates the amounts among the five mandates in proportion to their share of the total price change. Data source are derived from costs of local number portability, number pooling, enhanced 911, and CALEA. Lenard & Mast, *supra* note 110. Excess burden percentage is value of forgone output divided by wealth transfer.

296. Wealth transfer: \$0.35 per minute cost times 181 million wireline phone lines. These data are derived from \$0.35 per minute as being the midpoint of wireline local number portability charges approved by the FCC. See Public Notice, FCC, FCC Investigation Produces Lower Number Portability Charges for Customers of U S West Communications, Inc. (July 9, 1999), http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrc9043.html. For phone line data, see LOCAL TELEPHONE COMPETITION,

supra note 120. Forgone consumer surplus and forgone output: Equals zero because assumed elasticity of demand for local wireline phone service is virtually zero. See CRANDALL & WAVERMAN, *supra* note 6, at 91; Garbacz & Thompson (2005), *supra* note 48.

297. Wealth transfer: Calculated from subscriber data in *Tenth Report*, *supra* note 131, at tbl. 9, and cost estimate in Lenard & Mast, *supra* note 110, at tbls. 3, 5. Forgone consumer surplus and value of forgone output: Calculated using methods and sources of data described *supra* note 295. Excess burden percentage is value of forgone output divided by wealth transfer.

298. Wealth transfer: Calculated from subscriber data in *Tenth Report*, *supra* note 131, at tbl. 9, and cost estimate in Lenard & Mast, *supra* note 110, at 38. Forgone consumer surplus and value of forgone output: Calculated using methods and data sources described *supra* note 295. Excess burden percentage is value of forgone output divided by wealth transfer.

299. Wealth transfer: Calculated from subscriber data in *Tenth Report*, *supra* note 131, at tbl. 9, and cost estimate in Lenard & Mast, *supra* note 110, at 24–26. Forgone consumer surplus and value of forgone output: Calculated using methods and sources of data described *supra* note 295. Excess burden percentage is value of forgone output divided by wealth transfer.

300. Wealth transfer: Calculated from subscriber data in *Tenth Report*, *supra* note 131, at tbl. 9, and cost estimate in Lenard & Mast, *supra* note 110, at 29. Forgone consumer surplus and value of forgone output: Calculated using methods and data sources described *supra* note 295. Excess burden percentage is value of forgone output divided by wealth transfer.

301. The starting point for these calculations is a study that estimated the benefit to consumers from making an additional 200 MHz of spectrum available for mobile phone service. Since this benefit would occur naturally and swiftly under a more flexible spectrum policy but will take years under current policy, this Article assumes that this forgone benefit is a good proxy for the costs of current spectrum policy. All of the costs of spectrum policy can be calculated using the mathematical relationships defined in *supra* Part III.A. The forgone benefit, or total consumer cost, is \$77.4 billion. The calculations that generated this figure imply a price reduction of 50%, or \$0.056 per minute. See Hazlett et al., *supra* note 196. The \$54 billion wealth transfer was calculated by multiplying \$0.056 times the 966 billion wireless minutes used in 2003. Wireless minutes were calculated from subscriber and use data in *Tenth Report*, *supra* note 131, at tbls. 2, 9. The forgone consumer surplus figure was calculated by subtracting the \$54 billion wealth transfer from the \$77.4 billion total cost to consumers. Forgone producer surplus is equal to Hazlett et al.'s estimated price of wireless under a more flexible spectrum policy (\$0.056 per minute) minus the marginal cost of wireless (\$0.05 per minute) times the estimated increase in the number of minutes due to the price reduction. Marginal cost is from Hausman, *supra* note 24, at 737. The increase in the number of minutes is estimated using a demand elasticity of -2.32. HAZLETT & MUÑOZ, *supra* note 72, at 15. Excess burden percentage is value of forgone output divided by wealth transfer.

302. Wealth transfer: CRANDALL, *supra* note 242, at 54–56. Forgone consumer surplus: Assumes wealth transfer could have been used to reduce access and universal service charges on long distance. Calculated assuming price of \$0.07 per minute and demand elasticity of -0.7. LANDE & LYNCH, *supra* note 38. Elasticity estimate: Riordan, *supra* note 31. Potential change in long-distance price is estimated by dividing \$9.7 billion wealth transfer by 333.8 billion domestic interstate conversation minutes. These data are derived from LANDE & LYNCH, *supra* note 38. Value of forgone output: Calculation assumes \$9.7 billion wealth transfer would have been used to reduce universal service charges on long distance and wireless. Each dollar of wealth transfer generates \$0.65 of excess burden for long-distance and \$0.53 for wireless. To determine how much of the wealth transfer should be allocated to each service, the \$9.7 billion wealth transfer was divided between long-distance and wireless proportionate to their contributions to the federal Universal Service Fund. See Hausman, *supra* note 67, at 40; Hausman, *supra* note 24, at 735. Long distance and wireless contributions to federal universal service fund are from TRENDS IN TELEPHONE

SERVICE, *supra* note 60, at tbl. 19.15. Excess burden percentage is value of forgone output divided by wealth transfer.

303. Wealth transfer: The amount of wealth transferred from the incumbent to competitors equals $L \cdot (R - W - C)$, where L is the number of lines the incumbent leases competitors at a wholesale discount, R is the revenue per leased line that the incumbent would have earned if it had sold the line to a retail customer, W is the wholesale price per line received by the incumbent, and C is the cost per line that the incumbent avoids when it leases a line instead of selling it to a retail customer. Wealth transfers were calculated on a state-by-state basis and then summed to produce the total. Data sources: L is from LOCAL TELEPHONE COMPETITION, *supra* note 120, at tbl. 10. R is from Gregg, *supra* note 41. W is 75% of L, assuming a 25% wholesale discount. See Crandall & Hausman, *supra* note 190, at 84. C is from AT&T, UNE-P vs. 271 LD Entry: What's the real tradeoff for the RBOCs? 6, 8 (Sept. 17, 2002), http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6513293103. Forgone consumer surplus: Assumes wealth transfer could have been used to reduce access and universal service charges on long distance. Calculated assuming a long-distance price of \$0.07 per minute and demand elasticity of -0.7. These data are derived from LANDE & LYNCH, *supra* note 38. Elasticity estimate: Riordan, *supra* note 31. Potential change in long-distance price is estimated by dividing \$21 million wealth transfer by 333.8 billion domestic interstate conversation minutes. These data are derived from LANDE & LYNCH, *supra* note 38. Value of forgone output: Calculation assumes \$21 million wealth transfer would have been used to reduce universal service charges on long distance. Each dollar of wealth transfer generates \$0.65 of excess burden for long distance. Excess burden figure is from Hausman, *supra* note 24. Excess burden percentage is value of forgone output divided by wealth transfer.

Why Stovepipe Regulation No Longer Works: An Essay on the Need for a New Market-Oriented Communications Policy

Randolph J. May*

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I. INTRODUCTION

As we approach the ten year anniversary of the enactment of the Telecommunications Act of 1996 (“1996 Act”),¹ a fairly broad consensus has emerged that the existing “stovepipe” regulatory framework contained in the statute is woefully outdated and an impediment to the development of sound communications policy.² So, Congress is beginning to consider

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1. Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (codified in scattered sections of 47 U.S.C.).

2. See, e.g., James B. Speta, *Deregulating Telecommunications in Internet Time*, 61 WASH. & LEE L. REV. 1063 (2004); Richard S. Whitt, *A Horizontal Leap Forward: Formulating a New Communications Public Policy Framework Based on the Network*

whether new communications legislation is needed to supplant the 1996 Act. In light of the profound technological and marketplace changes that have occurred in the last decade, especially those attributable to the accelerating proliferation of digital technologies and services, any new legislative reform effort should include an examination of the division between federal and state regulatory authority, the amalgam of subsidies known as the Universal Service system, and management of the spectrum.

But there is nothing more important to the project to conceive a new act than the replacement of the existing statute's stovepipe regulatory model with a new framework that reflects today's digital age competitive marketplace realities. Indeed, this effort has to be at the heart of any serious effort to write what one might call a new Digital Age Communications Act.

The purpose of this brief essay is to show why a replacement regulatory regime is needed. Its purpose is not to prescribe what the new model should look like, although I will conclude by suggesting that some form of market-oriented model should be adopted.

II. THE EXISTING REGULATORY FRAMEWORK: VERTICAL STOVEPIPES BASED ON TECHNO-FUNCTIONAL DISTINCTIONS

Stovepipe regulation refers to the fact that (1) the act contains definitions for variously denominated communications services, such as "telecommunications," "information services," "cable service," "mobile service," "broadcasting," and "open video system," and (2) different regulations apply depending upon a service offering's classification. Hence, the stovepipes, or vertical "silos" or "smokestacks" as some prefer, refer to the distinct sets of regulations that attach to a service offering once it is classified under one definition or the other.

The existing stovepipe regulatory framework no longer makes sense. With a bit of poetic license, you might say the fires of the digital revolution have destroyed the stovepipes. In any event, the point is that the old stovepipe paradigm, with its origins rooted in the original Communications Act enacted in 1934 ("1934 Act"), is now obsolete.

The current regime is obsolete because the statutory definitions found in the 1996 Act that are the foundation of the existing regulatory model rest upon what I have called "techno-functional constructs."³ These techno-functional constructs simply no longer work well in a digital world.⁴ These

Layers Model, 56 FED. COMM. L.J. 587 (2004); Christopher S. Yoo, *New Models of Regulation and Interagency Governance*, 2003 MICH. ST. L. REV. 701.

3. Randolph J. May, *Calling for a Regulatory Overhaul, Bit by Bit*, CNET NEWS, Oct. 19, 2004, <http://news.com/Calling+for+a+regulatory+overhaul%2C+bit+by+bit/> 2010-1028_3-5415778.html.

4. Christopher Yoo has put it this way: "Gone are the days in which each

particular techno-functional constructs are necessarily implicated in many of today's most hotly contested regulatory battles, for example, those involving the statutory definitions of "telecommunications" and "information service."

Telecommunications is defined as "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received."⁵ An information service is "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications . . . but does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service."⁶ Now, these definitions are nothing if not grounded firmly in techno-functional constructions: transmitting information among points "specified by the user,"⁷ "without a change in form or content," "generating," "storing," "processing," "retrieving," "transforming" information, and so on.⁸

Think for a moment about the meaning these words convey. What does it mean to say "transforming" information, or transmitting information between two points "without change in the form or content" of the information? For example, I send you an instant message, or "IM," typing a letter in one font on my keyboard. As a result of your or my terminal settings or Internet Service Provider's protocols, the letter appears on your screen in another font, or without the smiley face I attached to it. Has there been a change in form or content of the information sent or received? Has there been a transformation of the information?

communications technology could be regarded as occupying a separate regulatory silo. The impending shift of all networks to packet-switched technologies promises to complete the collapse of any remaining attempt to base regulation on differences in the means of transmission." Yoo, *supra* note 2, at 714 (citation omitted).

5. 47 U.S.C. § 153(43) (2000).

6. § 153(20).

7. § 153(43).

8. § 153(20). The definitions found in the 1996 Act of "telecommunications" and "information service" essentially track the "basic" and "enhanced" services definitions developed in the Federal Communication Commission's ("FCC") landmark *Computer II* proceeding to distinguish between regulated transmission services and unregulated online services employing computer processing. Second Computer Inquiry, *Final Decision*, 77 F.C.C.2d 384 (1980) [hereinafter *Computer II*]. They have been interpreted by the FCC to extend essentially to the same functions so that all of the services the FCC previously considered to be "enhanced services" are "information services." See Implementation of Non-Accounting Safeguards of Sections 271 and 272 of the Communications Act of 1934 as amended, *First Report and Order and Further Notice of Proposed Rule Making*, 11 F.C.C.R. 21905, paras. 102-04 (1996).

This surely is the stuff of digital age philosophers. That is why, in early 2004 in connection with thinking about the then just-over-the-horizon but sure-to-come fights regarding the new Internet telephony, or Voice over Internet Protocol (“VoIP”) services, I referred to the distinctions to be suggested and argued for purposes of regulatory classification as metaphysical. Certainly, the statute’s definitions are in accord with Webster’s definition of metaphysics: (1) “of or relating to what is conceived as transcendent, supersensible, or transcendental;” (2) “highly abstract or abstruse;” (3) “expressions of attitudes about which rational argument is impossible.”⁹ In fact, so convinced was I of the importance of hastening an understanding that the current techno-functional regulatory regime rested on collapsing ground that I could not resist dashing off a brief commentary entitled, only half facetiously, *The Metaphysics of VoIP*.¹⁰

It is not only the telecommunications and information service stovepipes which rest on techno-functional constructs. Consider the statute’s “mobile services” definition, which includes terms such as “a regularly interacting group of base, mobile, portable, and associated control and relay stations . . .” and so on.¹¹ The definition of “cable service” turns on whether the transmissions are “one-way,” and either “video programming” or “other programming service[s],” and whether any “subscriber interaction” is required for the selection of such video programming.¹² Whether a transmission is “broadcasting” or not depends on whether radio communications, which itself turns on whether the transmission by radio is of writings, signs, signals, pictures, and sounds of all kinds, “intended to be received by the public,” are disseminated, whether “directly or by the intermediary of relay stations.”¹³

However serviceable these definitional constructs may have been at an earlier time, when analog systems were by far the prevalent communications transmission mode, they no longer are serviceable in a

9. WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 1420 (1993).

10. Randolph J. May, *The Metaphysics of VoIP*, Jan. 5, 2004, CNET NEWS, http://news.com.com/The+metaphysics+of+VoIP/2010-7352_3-5134896.html. For anyone interested in immersing him or herself more deeply in communications law metaphysics, I suggest reading some of the orders in the FCC’s almost decade-long effort to settle on a classification of protocol processing and protocol conversion services. To begin such a metaphysical feast, sample Federal-State Joint Board on Universal Service, *Report to Congress*, 13 F.C.C.R. 11501, paras. 49–52 (1998) [hereinafter *Federal-State Joint Board*] (dealing with the struggle to classify services under the 1996 Act’s definitions and the FCC’s *Computer II* regime).

11. 47 U.S.C. § 153(27).

12. 47 U.S.C. § 522(6) (2000).

13. § 153(6).

world in which digital technology is rapidly displacing analog. The old saying “a bit is a bit is a bit” really does have important implications from a regulatory policy perspective. It is economically, if not technically, infeasible to distinguish among voice, data, and video bits that travel along in the same communications stream. In other words, “[o]nce all communications are reduced to bits and bytes, all media will constitute substitutes for one another, and attempts to segment markets based on the means of conveyance will become increasingly problematic.”¹⁴

I do not mean to deny the regulators’ ingenuity or their good intentions in creating these definitional constructs, or in striving to render them serviceable for as long as possible. Take the FCC’s landmark *Computer II* proceeding from the early 1980s.¹⁵ It was then, when data processing capabilities and communications services first were becoming intertwined in nascent online applications such as e-mail and data retrieval, that the FCC created the regulatory distinction between basic and enhanced service. And it was this distinction that was carried over into the 1996 Act in the form of the current “telecommunications” and “information services” definitions.¹⁶ In essence, a basic service was pure transmission capacity while enhanced services were applications with computer processing capabilities dependent upon telecommunications to be carried from one place to another.¹⁷

The FCC’s purpose in creating this new distinction was salutary: if the new online services had been classified as just another form of basic communications, the services would have been subject to public utility-style regulation under the common carrier mandates of Title II of the 1934 Act.¹⁸ The FCC thought, correctly, that online services could and would develop on a competitive basis, and therefore, should be free from the economic regulation to which common carriers were subject.¹⁹

Acting under the constraints of the 1934 Act, the FCC’s *Computer II* decision was sound policy. Online services, from the early CompuServe and Prodigy services, to the upstart America Online, and on through the birth and spread of the ubiquitous World Wide Web, did indeed flourish on

14. Yoo, *supra* note 2, at 714.

15. *Computer II*, *supra* note 8.

16. *See id.* and accompanying text.

17. *Id.* paras. 95–97.

18. *Id.* para. 114; *see also* IP-Enabled Services, *Notice of Proposed Rule Making*, 19 F.C.C.R. 4863, para. 25 (2004) [hereinafter *IP-Enabled Services*] (“Providers of ‘basic’ services were subjected to common carrier regulation under Title II of the Act. . . . [T]he Commission declined to treat providers of enhanced services as ‘common carriers’ subject to regulation under Title II of the Act.”) (citations omitted).

19. *See Computer II*, *supra* note 8, para. 101; Speta, *supra* note 2, at 1084.

an unregulated basis. Without any real controversy, *Computer II*'s "basic" and "enhanced service" definitions were embodied in essentially the same form in the 1996 Act as "telecommunications" and "information services."

III. THE PROBLEM: DIGITAL TECHNOLOGY AND ABUNDANT BANDWIDTH UNDERMINE THE STOVEPIPES

What once may have been wise policy, and manageably serviceable, in a predominantly narrowband communications environment is much more problematic today as broadband networks become more ubiquitous. Recall that in the narrowband world, at least as a matter of shorthand, we could, commonly if not universally, equate voice with telecommunications, data with information services, and video with cable service. For a long time, limited bandwidth in the narrowband world masked the inherently problematic nature of the separate techno-functional boundaries upon which both the 1934 and 1996 acts' regulatory boundaries rested.

The abundant bandwidth of broadband networks, which enables fast-growing services such as Internet access and VoIP Internet telephony to be technically and economically viable, tugs mightily at the regulatory mask. Is high speed cable modem Internet access service "cable," "telecommunications," or an "information service"? The FCC deemed cable modem service an unregulated information service under the 1996 Act's definitional scheme. In June 2005, a divided Supreme Court handed down a decision in *National Cable & Telecommunications Association v. Brand X Internet Services*, which reversed an appeals court decision holding that cable modem service is a combination of "telecommunications" and "information service" potentially subject to public utility-type regulation.²⁰ What about the high speed Digital Subscriber Line ("DSL") Internet access services offered by the traditional telephone companies? Until September 2005, when the FCC finally reclassified it as an unregulated information service not long after the *Brand X* decision was handed down,²¹ DSL was classified a regulated telecommunications service.

Next, consider the VoIP Internet telephony services. The FCC has

20. Inquiry Concerning High-Speed Access to the Internet Over Cable and Other Facilities, *Declaratory Ruling and Notice of Proposed Rule Making*, 17 F.C.C.R. 4798 (2002), *vacated in part and remanded sub nom. Brand X Internet Servs. v. FCC*, 345 F. 3d 1120 (9th Cir. 2003), *rev'd and remanded*, *National Cable & Telecomm. Ass'n. v. Brand X Internet Servs.*, Nos. 04-277 and 04-281, 2005 U.S. LEXIS 5018 (June 27, 2005), 125 S.Ct. 2688 (2005) [hereinafter *Brand X*].

21. See *Appropriate Framework for Broadband Access to Internet Over Wireline Facilities, Report and Order and Notice of Proposed Rulemaking*, 20 F.C.C.R. (forthcoming 2006), 236 Comm. Reg. (P & F) 944 (2005).

ruled that pulver.com's "Free World Dialup" ("FWD") service, which is a "computer-to-computer" voice application that does not use ordinary telephone numbers or originate or terminate calls on the public switched network, is an information service.²² Following the 1996 Act's formulation, the FCC concluded that FWD "is an information service because FWD offers 'a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications.'"²³ The FCC added that the fact that FWD happens "to, among other things, enable members to talk over the Internet,"²⁴ rather than, for example, play video games, does not affect its characterization as an information service.

How does the FCC classify the VoIP offering by Vonage, a company that bills itself as "the broadband telephone company"?²⁵ Vonage's Digital Voice customers, who must have access to a broadband connection to subscribe, make calls that use ordinary telephone numbers and may either originate or terminate on the public network. The FCC recently acted to preempt state economic regulation of Vonage's Digital Voice and other VoIP services with similar characteristics, such as those offered by cable companies, by ruling that they are interstate services.²⁶ Pointing to its already initiated rulemaking regarding VoIP and other IP-enabled services, the FCC refrained from addressing the classification of Vonage's Digital Voice and similar services for federal regulatory purposes. But note that the FCC did point out that Vonage's service "resembles the telephone service provided by the circuit-switched network."²⁷

In its IP-Enabled Services rulemaking notice, the FCC explains how the greater bandwidth of broadband networks encourages the introduction of services "which may integrate voice, video, and data capabilities while maintaining high quality of service."²⁸ Then, in a truism, the FCC adds: "[I]t may become increasingly difficult, if not impossible, to distinguish 'voice' service from 'data' service, and users may increasingly rely on

22. Petition for Declaratory Ruling that Pulver.com's Free World Dialup is Neither Telecomm. Nor a Telecomm. Serv., *Memorandum Opinion and Order*, 19 F.C.C.R. 3307 (2004), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-27A1.pdf [hereinafter *Pulver.com Petition*].

23. *Id.* para. 11 (citing 47 U.S.C. § 153(20)).

24. *Id.* para. 19.

25. Vonage Home Page, <http://www.vonage.com>.

26. Vonage Holdings Corp. Petition for Declaratory Ruling Concerning an Order of the Minn. Pub. Utils. Comm'n, *Memorandum Opinion and Order*, 10 F.C.C.R. 22,404 (2004), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-04-267A1.pdf [hereinafter *Vonage Petition*].

27. *Id.* para. 4.

28. *IP-Enabled Services*, *supra* note 18, para. 16.

integrated services using broadband facilities delivered using IP rather than the traditional PSTN (Public Switched Telephone Network).²⁹ At the end of 2004, there already were almost thirty-eight million high-speed broadband Internet connections in service, an increase of 34% during just that year.³⁰ Analysts project that as soon as 2009 there will be twenty-seven million VoIP lines in service.³¹

IV. THE CONSEQUENCES: COMPARABLE SERVICES ARE REGULATED DIFFERENTLY UNDER THE STOVEPIPE REGIME

But does it matter that, according to the FCC's own characterization, Vonage and other providers of similar Internet telephony services that "enable [users] to talk over the Internet"³² and "resemble"³³ what we used to call POTS, or "plain old telephone service," may be regulated very differently? Does it matter that broadband Internet access services provided by cable television and telephone companies (and perhaps soon to be provided by satellite and power companies) may be regulated differently, even while they already compete vigorously with each other?

Of course it matters. Providers of telecommunications services are generally subject to price and entry regulation as common carriers; information services providers are not.³⁴ Telecommunications services may be required to be unbundled so that competitors may access the unbundled network elements at regulated rates.³⁵ Information services are not subject to mandatory access requirements. Telecommunications services are subject to certain social obligations, such as universal service contributions and tax payments, from which non-telecommunications services presently are exempt.³⁶ Telecommunications services also are subject to certain health and safety mandates. For example, telecommunications services must provide enhanced 911 ("E911") service, and are subject to disability and wiretap capability requirements that are not generally applicable to non-telecommunications services.³⁷ Cable operators are subject to certain

29. *Id.*

30. See Press Release, FCC, Federal Communications Commission Releases Data on High-Speed Internet Access Services (July 7, 2005) (explaining that the number of high-speed lines in service at the end of 2004 reported to be 37.9 million).

31. net2phone, 2005 Annual Report 3 (2005), available at <http://web.net2phone.com/about/investor/2005AR.pdf>.

32. See *Pulver.com Petition*, *supra* note 22, para. 19 and accompanying text.

33. See *Vonage Petition*, *supra* note 26, para. 4.

34. See *IP-Enabled Services*, *supra* note 18, paras. 24–25.

35. *Id.* para. 26.

36. See generally *Federal-State Joint Board*, *supra* note 10; see also *IP-Enabled Services*, *supra* note 18, paras. 63–66.

37. See *IP-Enabled Services*, *supra* note 18, paras. 26, 45–60.

regulatory obligations that do not apply to non-cable services, such as obtaining a local franchise and paying local franchise fees.³⁸ States and localities impose different rights-of-way obligations and fees, depending on how a service is classified.³⁹

Thus, services that are comparable, at least from the consumers' perspective, and that compete head-to-head against each other in the marketplace, are subject to different regulatory requirements based solely on how the service offerings are classified. For example, despite the fact that cable operators have had close to twice as many broadband Internet access subscribers as do the telephone companies,⁴⁰ until very recently the broadband offerings of cable and telephone companies were subject to very different regulatory regimes.⁴¹ In short, the existing service classifications based upon techno-functional characteristics have little or nothing to do with how consumers perceive the services or the marketplace position of the service providers.

V. THE SOLUTION: A NEW MARKET-ORIENTED MARKET PARADIGM

It should be obvious that a new regulatory framework is needed for communications policy. My purpose here has been to provide the background and context for understanding why a new paradigm is needed rather than to offer any detailed prescription for such regulatory framework. Nevertheless, in concluding, some general thoughts about the direction such change should take may not be out of order.

First, what should be avoided is a new framework that just substitutes one set of techno-functional constructs for another. For example, MCI's Senior Director for Global Policy and Planning, Richard Whitt, has proposed that policymakers "adopt a comprehensive legal and regulatory framework founded on the Internet's horizontal network layers."⁴² He identifies four layers—content, applications, logical, and physical—that he claims comprise the Internet's architecture.⁴³ He urges that public policy be formulated to respect the integrity of the distinct layers for purposes of determining whether regulation is needed of providers of services within

38. See 47 U.S.C. §§ 541, 542 (2000) (authorizing local governments to award franchises for the provision of cable service and to require payment of franchise fees).

39. See National Telecommunications and Information Administration, 50-State Survey of Rights-of-Way Statutes, <http://www.ntia.doc.gov/ntiahome/staterow/rowtableexcel.htm>.

40. See Press Release, FCC, *supra* note 30.

41. See *supra* notes 20–21 and accompanying text.

42. See Whitt, *supra* note 2, at 591.

43. *Id.* at 592.

the layers.⁴⁴

Whitt then suggests that the two lower layers, the logical and physical, should be targeted for discrete regulation based on his claim that significant market power resides in these layers.⁴⁵ The physical layer roughly corresponds to the network facilities of the cable, telephone, satellite, wireless, and other companies that transport information. The logical layer roughly corresponds to the software codes and protocols, such as Transmission Control Protocol/Internet Protocol ("TCP/IP"), that interface with the physical layer below and the applications and content layers above. Whitt calls this proposed layers model "a horizontal leap forward."⁴⁶

But turning stovepipes on their side is not necessarily a leap forward; rather, it is an invitation to stultify the continued evolution of our physical networks and the service applications that may be integrated into such networks. It is difficult to predict, especially in a technologically dynamic environment, how network platforms, or the Internet, really an interconnected network of network platforms, will evolve on a technical or functional basis. Today's seemingly discrete Internet layers may be obsolete, or at least meaningfully altered, tomorrow.

What is needed is a new market-oriented model that breaks with the past, not a replacement regime based on just another set of techno-functional constructs.⁴⁷ A market-oriented model that employs antitrust law or antitrust-like principles would focus on the structure of the marketplace: whether individual service providers possess market power that should be constrained by some form of regulation, and whether such constraints generally should be applied in the form of *ex ante* proscriptions or more narrowly-tailored *ex post* remedial orders. Such a market-oriented model would put the focus on the consumer—and consumer welfare—where it belongs, not on distinctions grounded in particular technology platforms or arcane functional characteristics that have little to do with existing marketplace realities. It would greatly reduce the opportunities for regulatory gaming that are inherent in the current regime.

Thus, under this approach, comparable services ("substitutable" services in antitrust parlance) from the consumers' perspective would not

44. *Id.*

45. *Id.*

46. *Id.* at 587.

47. What is also needed is a slimmer, more efficient, and more accountable regulatory agency with jurisdiction over communications, in other words, a transformed and reformed FCC. But that is another story unto itself. See Randolph J. May, *The FCC's Tumultuous Year 2003: An Essay on an Opportunity for Institutional Agency Reform*, 56 ADMIN. L. REV. 1307 (2004).

be subject to differential regulatory treatment just because they are delivered over different technology platforms or employ different functional bells and whistles. By the same token, comparable services might be subjected to differential regulatory treatment if there is a market-oriented reason to do so in order to enhance consumer welfare.

After all, any regulatory regime ultimately should be judged based on whether or not it advances or impairs marketplace competition and promotes consumer welfare, not on whether it advances or impairs the prospects of particular competitors, or protects the jobs of current regulators.

A Model for Emergency Service of VoIP Through Certification and Labeling

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I. INTRODUCTION

Voice over Internet Protocol (“VoIP”) promises to upend a century-old model of voice telephony by creating a more dynamic marketplace and by changing the point of control from the central office switch to the end user’s device. The transformation to VoIP is only in its very early stages, and it will ultimately impact all sectors of the telecommunications services industry, including traditional incumbent local exchange carriers, cable providers, wireless service providers, and emergency service providers. In fact, all of the relevant stakeholders affected by VoIP (e.g., service providers, hardware and software vendors, customers, and governmental agencies) share a great need to analyze the issues raised by the transition from the traditional Public Switched Telephone Network (“PSTN”) to a packet-switched, Internet Protocol-based (“IP”) architecture. For example, service providers and hardware and software developers are struggling to understand and take advantage of opportunities in this area involving new technology prospects (e.g., integrated messaging and mobile collaboration). Moreover, business, governmental, and residential consumer users of telecommunications equipment and services are seeking guidance on when and how to upgrade to a new technological frontier. Finally, governmental agencies are struggling to ensure that social policy concerns will be addressed in this very different technological environment.

The social policy implications of VoIP present regulators and incumbent businesses with an unusual dilemma, forcing them to choose from amongst mutually exclusive—and equally unfavorable—options. Under the current PSTN-based voice telephone network, many critical policy goals, such as the provision of reliable emergency services, are implemented effectively and reliably. However, most VoIP services, at least as they exist today, do not deliver the same level of quality and dependability as emergency services. In response, some state regulators have considered passing regulations requiring VoIP to meet legacy and other requirements, regardless of the dramatic differences in the VoIP service’s technical and business models.¹ The Federal Communications

1. *Vonage Holdings Corp. v. Minn. Pub. Utils. Comm’n*, 290 F. Supp. 2d 993 (D. Minn. 2003). Note that newer service providers have already started to tell consumers that VoIP services may not meet traditional Emergency 911 (“E911”) expectations, although they have not yet described what the alternative expectations might be. For example, an AT&T spokesperson, referring to the company’s consumer VoIP service, indicates, “We make very clear to our customers that our CallVantage Internet phone service does not work the same as traditional landline 911.” *911 Calls Made Over Internet Often Get Lower Priority*, USA TODAY, Oct. 12, 2004, available at http://www.usatoday.com/tech/news/2004-10-12-voip-trouble_x.htm.

Commission ("FCC") has only begun to develop its regulatory VoIP strategy, although former Chairman Michael Powell made it clear that the strategy would need to differ from the legacy model used in the PSTN context, a position likely to continue in successor FCC administrations.² With these thoughts in mind, it is unclear how VoIP services might evolve in a meaningful and timely fashion.

In a number of specific circumstances, however, self-regulation can be a viable alternative to government regulation. Certification, in particular, can be provided by a self-regulatory body as evidence of conformance to required attributes, practices, or policies. Self-regulation has a number of potential advantages, and in the case of VoIP emergency services, we are particularly interested in recognizing information asymmetries between industry and government, given the increase in complexity and heterogeneity inherent in the move from PSTN to VoIP. In order for self-regulation to be viewed as a credible alternative and in order for it to ultimately succeed, it needs to be situated within a careful institutional framework that includes (1) a clear and consistent external motivation (e.g., an incentive in terms of third-party liability); (2) a process for determining the specifications to be certified; (3) identification of certifiers and determination if a competitive market for certification exists; (4) reference to an appropriately neutral accrediting party—a role that government can but does not have to fill; (5) communication of certification to users; and (6) policing of certification. The telecommunications industry has repeatedly demonstrated the ability to self-regulate in areas of interoperability where economic motivation can be relied on to incentivize the activity. In this case, though, the industry should self-regulate in order to address a social policy goal. Success in this area could even help self-regulation become a tool that could be applied in other areas of social policy, especially in the development of new policy initiatives that would otherwise be imposed through government regulation of telecommunications, as has traditionally been the case.

The particular technical challenges surrounding VoIP emergency services arise from two major drivers: variability and location. VoIP can be seen as a much more variable service than traditional PSTN-based telephony, and many new business models and technical combinations are emerging in which quality, methods of initiating and terminating calls, integration with other messaging technologies,³ and types of terminals

2. Written statement of Michael K. Powell, Chairman, FCC, on Voice over Internet Protocol (VoIP) (Feb. 24, 2004), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-244231A1.pdf.

3. Indeed, we should ask to what extent social policy expectations of emergency services' response to voice communications should also apply to the many other modes of

(e.g., phones, PDAs, and PCs) have all become heterogeneous. For emergency services in particular, IP networks are fundamentally location independent, and VoIP services may run on IP networks over many different types of wired and wireless access.⁴ As a result, these realities challenge a fundamental modern expectation: that an emergency services dispatcher can identify the caller's location even if the caller does not know the location or is not able to describe it. Although substantial technical progress is being made regarding the provision of emergency services in various VoIP settings, users may not be able to determine prior to an emergency whether the particular service they are employing is capable of emergency service. Accordingly, labeling should be used as a means of specifying the particular level of emergency service capability provided, in recognition of the fact that VoIP's diversity will preclude a single common requirement for all possible VoIP services. Also, an emergency service testing capability should be made available to the end user.

This Article will describe the technical issues surrounding emergency service in VoIP, examine the status of proposed technical strategies,⁵ and identify candidate criteria to be used in certification. Furthermore, this Article will examine the theories behind and examples of successful certification within self-regulatory regimes, including (1) the use of certification in product safety; (2) the use of certification in particular by Underwriters Laboratories acting as certifying institutions; (3) ISO 9000 quality system certification; (4) interoperability certification within the telecommunications industry through Cable Television Laboratories and Telcordia; (5) the Wi-Fi Alliance as a consumer-oriented certification

communication that are now popular or that may become popular, such as e-mail, instant messaging, and video telephony. Given the possible breadth of regulation implied by such an increase in scope, we submit that the option of effective self-regulation would be even more valuable for all of these services than for telephony emergency services alone.

4. For example, VoIP is increasingly carried over Wi-Fi wireless local access networks, and dual-mode phones that can switch between VoIP/Wi-Fi and cellular service are now being marketed. See Corie Lok, *One Person, One Phone*, TECH. REV., Mar. 2004; Marguerite Reardon, *Wi-Fi and VoIP: Is Sum Greater Than Parts?*, CNET.COM, Mar. 1, 2004, http://news.com.com/2102-7352_3-5167782.html.

5. VoIP has a number of different signaling frameworks, including the Session Initiation Protocol ("SIP") and H.323. For the most part, we attempt to proceed in a framework-independent manner in this paper; however, in cases where the framework is relevant, we focus on the SIP framework. We fully acknowledge that development of actual certification standards will need to consider multiple frameworks. Our emphasis on SIP is motivated by technical, market, and policy issues that are outside the scope of this Article. See Glenn Fleishman, *An Internet Extension to Your Telephone Twin*, N.Y. TIMES, Aug. 28, 2003, at G3 (explaining in basic terms how a SIP phone works). For a good overview of SIP located at the Internet Engineering Task Force Web site, see generally Session Initiation Protocol (SIP) Charter, <http://www.ietf.org/html.charters/sip-charter.html> (last visited Nov. 16, 2005).

consortium; and (6) general experience with self-regulation in environmental policy. In the end, this Article will synthesize these insights in order to propose specific recommendations on institutional design, technical criteria, and the certification process.

II. EXISTING MODELS FOR CERTIFICATION

This Part presents the results of secondary research into existing certification processes. Drawing on historical analysis and literature review techniques, this research incorporates the collection and analysis of original descriptions, outcomes research on certification processes, and research on the manner in which these processes have been embedded in overall policy systems including government regulation. In the end, this Part offers an overall model for successful certification tailored to the particular technical and industrial circumstances of VoIP.

A. Theory and Practice of Certification

Well-established certification processes are used in professions, such as medicine and law to accredit practitioners, in securities markets by underwriters and auditors, and in product safety and compatibility arenas. More recently, certification and, more broadly, self-regulation have emerged in new social policy settings (e.g., the certification of a manufacturer's compliance with labor practice expectations in developing countries or with specific environmental practices). Substantial research has created a reasonable understanding of the purpose of certification, as well as of its challenges and drawbacks.

Certification can have both economic and social policy goals. In economic terms, products or services may have attributes, such as quality or safety, that buyers have difficulty ascertaining prior to the purchase. As a result, consumers oftentimes cannot distinguish between products, a situation that leaves little incentive for companies to include the attributes in the first place. Although reputation, brand, and warranties may mitigate this effect, such factors fall short if they are inconsistent or if customers find it too difficult or costly to apply the factors as a recourse. Certification can thus provide an alternate method for reliably signaling attribute distinctions.⁶ For social policy, certification, as an aspect of self-regulation, can serve as an alternative or complement to government regulation. In other words, certification can be used as a means of avoiding the overproduction of negative social externalities (e.g., pollution) and the underproduction of positive social externalities (e.g., safety policies).

6. Gian Luigi Albano & Alessandro Lizzeri, *Strategic Certification and Provision of Quality*, 42 INT'L ECON. REV. 267, 268 (2001).

Moreover, certification can offer important advantages over direct “command-and-control” regulation. For example, certification can reduce the demand on government services and, consequently, on required levels of taxation; put another way, certification can better accommodate a neo-liberal reduced-government capability. It can also exploit information asymmetries in which industry participants have more (and better) information than a potential government regulator.⁷ The direct use of industry information may increase the rate at which regulation can adapt as circumstances change and may also subsequently reduce the need to enumerate all conceivable contingencies, resulting in more flexible and lighter-weight regulation.⁸ Furthermore, preemptive self-regulation may eliminate the need for industries and their opponents to make politically motivated investments in regulatory policies.⁹

Self-regulation can also have a moral and cultural effect by inculcating an ethical component in institutional self-image that induces behavior that exceeds mere compliance with the letter of the law.¹⁰ Conversely, imposition of rigid regulation instead of self-regulation on sectors that have a strong anti-authoritarian tradition, as commentator Darren Sinclair notes, “can ‘destroy virtue in the business community.’”¹¹ We believe that it is far too early to suggest that the telecommunications industry is incapable of producing its own solutions.

On the other hand, certification can have undesirable side effects that should be anticipated in institutional design. If certifiers are under the

7. See generally Hayne E. Leland, *Quacks, Lemons, and Licensing: A Theory of Minimum Quality Standards*, 87 J. POL. ECON. 1328 (1979).

8. Christodoulos Stefanadis, *Self-Regulation, Innovation, and the Financial Industry*, 23 J. REG. ECON. 5, 7 (2003).

9. In this case, the end result is a Pareto improvement in welfare. See John W. Maxwell, Thomas P. Lyon, & Steven C. Hackett, *Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism*, 43 J. LAW & ECON. 583 (2000). See also Economist.com, *Research Tools Economics A-Z* <http://www.economist.com/research/Economics/>, which defines Pareto efficiency as follows:

A situation in which nobody can be made better off without making somebody else worse off. Named after Vilfredo Pareto (1843–1923), an Italian economist. If an economy’s resources are being used inefficiently, it ought to be possible to make somebody better off without anybody else becoming worse off. In reality, change often produces losers as well as winners. Pareto efficiency does not help judge whether this sort of change is economically good or bad.

10. See Marius Aalders & Ton Wilthagen, *Moving Beyond Command-and-Control: Reflexivity in the Regulation of Occupational Safety and Health and the Environment*, 19 LAW & POL’Y 415 (1997); Simon Ashby, Swee-Hoon Chuah, & Robert Hoffmann, *Industry Self-Regulation: A Game-Theoretic Typology of Strategic Voluntary Compliance*, 11 INT’L J. ECON. BUS. 91 (2004) (discussing self-regulation in terms of strategic interactions).

11. Darren Sinclair, *Self-Regulation Versus Command and Control? Beyond False Dichotomies*, 19 LAW & POL’Y 529, 537 (1997).

control of the body being certified, certification may be deliberately structured to restrict new entrants and extract monopoly rents for already certified parties,¹² an attribute of guilds that continues in contemporary professions that require certification.¹³ A parallel social policy concern relates to the credibility of the certifier, who may be perceived as being too tightly controlled by the certifying body.¹⁴

Ironically, though, should certification preempt some other form of regulation and succeed in spurring innovation and even new entrants, it is quite possible that incumbents would view the previous form of regulation as preferable even though a broader social perspective would favor certification. For this reason, we cannot conclude with assurance that all industry players will prefer certification even if it benefits both industry as a whole and society at large.

If the certification capability is limited to a single or small number of suppliers of certifications, the certification process itself might capture monopoly rents to the detriment of suppliers or consumers. More generally, even a competitive certifier market can exhibit peculiarities depending on the level of certifier liability, the regulation of the certifier market, and the amount of competition¹⁵ (e.g., situations in which certifiers do not provide

12. See Richard H. Stern, *The Bundle of Rights Suited to New Technology*, 47 U. PITT. L. REV. 1229, 1259 (1986) ("The incentives provided by the prospect of monopoly rent are the principal rationale for persuading society to permit innovators in technology to exact some monopoly rent.") Also note that Leland provides a more nuanced analysis of whether licensing results in standards that are too high in order to restrict competition: "If a professional group or industry is allowed to set minimum quality standards (self-regulation), these standards may be set too high or too low. On balance, however, there is some reason to expect too-high standards to be the more likely case." Leland, *supra* note 7, at 1342. See also Ulrike Schaede, *Industry Rules: From Deregulation to Self-Regulation*, 28 JAPANESE ECON., Nov.-Dec. 2000, at 35, 37-38 (pointing out that a related problem in which apparent deregulation in Japan, replaced by industry self-regulation, did little to weaken trade barriers).

13. Bernardo Bortolotti & Gianluca Fiorentini, *Barriers to Entry and the Self-Regulating Professions: Evidence from the Market for Italian Accountants*, in ORGANIZED INTERESTS AND SELF-REGULATION 131, 132 (Bernardo Bortolotti & Gianluca Fiorentini eds., Oxford University Press 1999); Roger Van Den Bergh, *Self-Regulation of the Medical and Legal Professions: Remaining Barriers to Competition and EC Law*, in ORGANIZED INTERESTS AND SELF-REGULATION 89, 111-16 (Bernardo Bortolotti & Gianluca Fiorentini eds., Oxford University Press 1999).

14. In social policy regulation, critics are quick to question the extent to which firms and industries will truly restrict themselves, notwithstanding their stated intentions. To some extent, this debate rests on questions as to whether firms optimize shareholder wealth or take a stakeholder perspective. See Javier Núñez, *A Model of Self-Regulation*, 74 ECON. LETTERS 91 (2001) (discussing the lack of incentives to expose fraud in self-regulation). See also Maxwell, et al., *supra* note 9, at 584 (stating self-regulation is the alternative to political regulation).

15. Luigi Alberto Franzoni, *Imperfect Competition in Certification Markets*, in ORGANIZED INTERESTS AND SELF-REGULATION 158, 159-60 (Bernardo Bortolotti & Gianluca

all information or choose to provide noisy information).¹⁶ The structure of the certifier market is consequently a non-trivial consideration.

The insurance industry plays a special role in certification as well, especially since certification may signal lower insurance risks, which may then be reflected in lower premiums. Not unexpectedly, insurers need to be able to rely on certifiers' independence from producers. For example, certifiers that vigorously compete for producer business may compromise the accuracy of certification, such as has happened with recent auditing scandals.¹⁷

Closely related to the role of insurance in certification is the role of liability. Liability, of course, already works in partnership with regulation when safety issues come into play, for neither liability nor regulation by itself is generally sufficient to produce socially desirable levels of care.¹⁸ From a producer's perspective, self-regulation that results in an active compliance activity may provide protection against imputation of "intent" to undertake unlawful acts.¹⁹ In product liability, for example, a showing of negligence usually requires all of the following elements to exist and requires all of the associated questions to be answered in the positive: (1) duty (did the vendor use "reasonable care"?), (2) breach of duty (was there unreasonable conduct involving an act or a failure to act?), (3) foreseeability (was the problem foreseeable?), (4) proximate cause (did the breach cause the damage?), and (5) damage (did the conduct cause physical injury or some other loss?).²⁰ A widely accepted industry certification or a government-endorsed certification, along with a vendor's consistent effort in securing such certification, can aid a defense on questions of duty and breach of duty.

A critical question in self-regulation is the appropriate role of

Fiorentini eds., Oxford University Press 1999).

16. See generally Reinier H. Kraakman & Ronald J. Gilson, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549 (1984) (discussing inefficiencies in certification markets).

17. As another example, periodic softness in the market for maritime insurance leads to lax responses to negative certification signals from insurers. See Frank Furger, *Accountability and Systems of Self-Governance: The Case of the Maritime Industry*, 19 LAW & POL'Y 445, 465 (1997).

18. See generally Steven Shavell, *A Model for the Optimal Use of Liability and Safety Regulation*, 15 RAND J. ECON. 271 (1984) (constructing a model showing that regulation does not result in appropriate risk reduction, nor does liability result in that outcome).

19. See also John C. Ruhnka & Heidi Boerstler, *Governmental Incentives for Corporate Self-Regulation*, 17 J. BUS. ETHICS 309, 310-11 (1998) (analogizing self-regulation to certain consequences that can be found in criminal antitrust cases).

20. See generally RESTATEMENT (THIRD) OF TORTS: PRODS. LIABILITY (1998); see also Victor E. Schwartz, *The Restatement (Third) of Torts: Products Liability: A Guide to Its Highlights*, 34 TORT & INS. L.J. 85 (1998) (providing a more in-depth discussion of the RESTATEMENT).

government. Pure self-regulation (i.e., regulation without any external influence) is usually rejected based on the lack of evidence showing that this mode naturally arises or is effective.²¹ Conversely, a broad correlation between evidence of governmental incentives for the creation of self-regulation and self-regulatory activity seems to suggest that successful and credible self-regulation is consistently coupled with some form of influence or oversight, leading to a model that might be described as co-regulation.²² Such external influences may come from government entities or, as is apparent in certain contemporary social policy cases, independent nongovernmental organizations with political influence or influence over consumer choice.²³ When influencing the formation of self-regulatory bodies, the government's manner of signaling its intentions can be important. In fact, game theory suggests that the government should firmly demonstrate zero tolerance of undesirable behavior and immediately invoke direct regulation if such behavior is observed.²⁴ On a more positive

21. See generally Jorge Rivera & Peter de Leon, *Is Greener Whiter? Voluntary Environmental Performance of Western Ski Areas*, 32 POL'Y STUD. J. 417 (2004) (noting that, absent oversight, a firm that joins a self-regulatory body may actually have a tendency to under perform when compared with firms that do not join, thus effectively deriving membership benefits without actually investing in the area subject to self-regulation).

22. Darren Sinclair, *Self-Regulation Versus Command and Control?: Beyond False Dichotomies*, 19 LAW & POL'Y 529, 537 (1997). As Sinclair points out, the tendency in some of the literature to paint command-and-control regulation and self-regulation as stark and distinct alternatives is overly restrictive:

Those who are locked into a paradigm which incorrectly assumes that choices have to be made between artificially restrictive models of self-regulation and command and control regulation are unlikely to be capable of appreciating the more nuanced opportunities for achieving both efficiency and effectiveness, which arise from complementary combinations of components of both types of instruments.

Id. at 532. Sinclair goes on to list the following four key components, which can be modulated to select a policy on the spectrum between command-and-control and self-regulation: "[T]he nature and extent of *regulatory compulsion*; the extent to which *regulatory flexibility* allows firms to accommodate their individual circumstances; the opportunity for *industry design input* into the negotiation and development of regulation; and the extent to which *win-win outcomes* are the focus of regulation." (emphasis in original) *Id.* at 533. The legal and regulatory incentives used to influence self-regulation have traditionally been, and often continue to be, primarily "punitive" in nature, though some more recent cases are shifting towards positive incentives that reward corporations for actions that encourage or assist desirable behavior. See Ruhnka & Boerstler, *supra* note 19, at 309.

23. Dara O'Rourke, *Outsourcing Regulation: Analyzing Nongovernmental Systems of Labor Standards and Monitoring*, 31 POL'Y STUD. J. 1, 3-5 (2003); see also Tim Bartley, *Certifying Forests and Factories: States, Social Movements, and the Rise of Private Regulation in the Apparel and Forest Products Fields*, 31 POL. & SOC'Y. 433 (2003) (discussing how social movement campaigns in a neo-liberal context lead to the emergence of private certification).

24. See Ashby, et al., *supra* note 10, at 102-04.

note, the government can also encourage self-regulation through a variety of positive signals regarding preferential treatment for diligent self-regulators.²⁵

Three processes that are commonly present in social regulation are also potentially applicable to co-regulation. These three processes are as follows: (1) prior approval, in which firms obtain approval before engaging in an activity; (2) mandatory standards, in which firms are required to comply with the regulation and undergo monitoring; and (3) information disclosure, in which firms are required to disclose facts to buyers that they might not otherwise choose to disclose.²⁶ Interestingly, the framework by which self-regulation is invoked can also result in unanticipated effects. For example, a government-crafted "voluntary agreement" may reduce industry efforts to engage in industry-devised self-regulatory activities, reducing profits and, thus, general welfare.²⁷ This point again suggests that government should apply credible pressure in order to motivate self-regulatory activity, while also exploiting the potential advantages of self-regulation, particularly information asymmetries between industry and government.

On a related note, another necessary element for the industrial self-regulatory component is coherent industry representation.²⁸ Possibilities include bodies establishing standards, industry associations, and the increasingly evident consortia in the information and communication technology industries. Care must be taken, however, especially in the latter group, to mitigate the potential for exclusion and reduced competition.²⁹

On a final note, software, an increasingly important product and component, differs greatly from many of the other types of products that

25. Ruhnka and Boerstler give as examples: (1) the recognition of compliance with self-regulation as a mitigating factor for corporate regulatory violations by regulating agencies, (2) state and federal prosecutors, and (3) in jury instructions and sentencing guidelines, the recognition of self-reporting as a mitigating factor by prosecutors and regulators and the substitution of internal compliance for agency monitoring. Ruhnka & Boerstler, *supra* note 19, at 314–21.

26. A. Ogas, *Regulatory Institutions and Structures*, 73 ANNALS OF PUBLIC AND COOPERATIVE ECON. 627, 631–34 (2002).

27. Thomas P. Lyon & John W. Maxwell, *Self-Regulation, Taxation, and Public Voluntary Environmental Agreements*, 87 J. PUB. ECON. 1453 (2003).

28. See generally, Frank Welsh, *Self-Regulation: The True Key to Success of Physician-Directed Networks*, 23 J. HEALTH CARE FIN. 1, 3 (1996) (describing the results of self-regulation in the medical profession and pointing out that increased participation through physician-led efforts is a key to success in self regulation in that field).

29. Richard Hawkins, *The Rise of Consortia in the Information and Communication Technology Industries: Emerging Implications for Policy*, 23 TELECOMM. POL'Y 159, 172 (1999).

have traditionally been certified.³⁰ Because software can directly affect safety, software reliability is increasingly scrutinized. Certification thus can serve the dual economic purposes of signaling quality to users and reducing the liability of producers.³¹ Software often has an iterative and incremental design character, so delaying certification testing until the completion of software implementation can be quite inefficient. Consequently, certification testing is better introduced as an integral part of the internal and regression-testing stages of software design.³² Interestingly, an organization that embeds certification testing throughout the design cycle can inculcate a culture in which the criteria used for certification become implicit organizational values (e.g., by embedding security certification testing, an organization can help foster a “security culture”).³³ However, implementation of broad software certification processes poses significant challenges. For instance, an organization may find it infeasible to maintain adequate criteria to certify products that change rapidly in function and capability. In such cases, certification may be practical only if it is restricted to aspects of the system that undergo fewer changes and that can be reasonably isolated. Moreover, different types of certification give rise to different challenges. Bruce Schneier, founder of Counterpane Internet Security, Inc., a managed security company in San Jose, California, points out that certifying for security—where threats are active, intelligent, and hostile—is more challenging than certifying for safety, where threats are usually passive and random.³⁴

B. Certification Examples

In order for us to appreciate the value that we can derive from a private model of certification, in this Subpart we will review several

30. Software has been subject to certification in a number of areas, most notably in the area of security. The U.S. government developed a set of security certification techniques referred to as the Orange Book. See Reid Skibell, *The Phenomenon of Insecure Software in a Security-Focused World*, 8 J. TECH. L. & POL'Y 107, 127 (2003) (describing the federal government's Trusted Computer System Evaluation Criteria, which is also referred to as the Orange Book Program).

31. Producers of software already have a history of limiting liability through the terms of software licenses. In light of this fact, some advocate an insurance-industry-driven certification regime akin to Underwriters Laboratory-style safety certification. Harold W. Lawson, *Infrastructure Risk Reduction*, COMM. OF THE ASS'N. FOR COMPUTING MACHINERY, June 1998, at 120.

32. See Patricia Rodriguez-Dapena, *Software Safety Certification: A Multidomain Problem*, IEEE SOFTWARE, July-Aug. 1999, at 31, 33.

33. See Greg Goth, *Will the Cyber-UL Concept Take Hold?*, IEEE SOFTWARE, July-Aug. 2002, at 12, 13.

34. See Scott Berinato, *A UL-Type Seal for Security? Don't Bet on It*, EWEEK, Oct. 16, 2000, at 11, 15.

examples of private and non-governmental organizations that have been successful in this field. By reviewing how other bodies have dealt with self-certification, we will be able to see that our proposal—while relatively new in the software world—is by no means a matter of first impression for technology companies.

1. Underwriters Laboratories and Product Safety Certification

Underwriters Laboratories (“UL”), incorporated as a nonprofit organization in 1901, was initially funded by the National Board of Fire Underwriters to prepare lists of safe products, thus demonstrating the potential benefits derived from linking certification to insurance.³⁵ When insurance industry funding ceased in 1916, UL became a self-sustaining organization through the collection of testing fees.³⁶ Today, manufacturers are motivated to seek UL certification because (1) some customers require it; (2) many consumers recognize it as an indicator of product safety; and (3) it can reduce manufacturer liability by supporting reasonable care claims.

Safety co-regulation by government agencies and an industry certifier, Underwriters Laboratories, is apparent in two distinct models. On the one hand, the Occupational Safety and Health Administration (“OSHA”) sanctions Nationally Recognized Testing Laboratories through an explicit accreditation process.³⁷ UL was originally the only such lab; now it is but one of several.³⁸ OSHA regulations thus compel

35. Courts have held that Underwriters Laboratories owe a duty of care to consumers:

The *raison d'être* of the UL mark is to show that a product has met safety standards. By offering its mark to manufacturers, UL has placed itself into the stream of commerce. . . . In some segments of the marketplace, the UL mark has great importance. Manufacturers desire UL approval, and their customers expect it. [P]laintiffs . . . should be able to seek recovery against UL where it . . . has been negligent. The UL seal does not guarantee that a manufacturer has acted with ordinary care but sound public policy requires that UL act with ordinary care in the conduct of its own business--the certification process.

United States Lighting Service v. Llerrad Corp., 800 F.Supp. 1513, 1517 (N.D. Ohio 1992), *vacated by agreement*, 807 F.Supp. 439 (N.D. Ohio 1992).

36. See Underwriters Laboratories Home Page, <http://www.ul.com/about/history/1910/> (last visited Nov. 16, 2005) (noting that in 1916 “[d]irect financial support from the insurance industry is discontinued. UL becomes self-sustaining on income from testing fees paid by manufacturers of products submitted for certification.”).

37. Accreditation fees for test laboratories are on the order of \$10,000. See *Nationally Recognized Testing Laboratories; Fees; Reduction of Public Comment Period on Recognition Notices*, 64 Fed. Reg. 45,098 (proposed Aug. 18, 1999) (to be codified at 29 C.F.R. pt. 1910), *available at* <http://tinyurl.com/3nl4o>.

38. OSHA’s decision in 1988 to create a competitive market for testing could not be the result of a strict profit motive on the part of UL because UL is a nonprofit organization. However, absent the discipline of competition, even a nonprofit organization may not evolve or diligently pursue efficiency initiatives. Current UL management is undertaking a

manufacturers to produce and buy certified products from accredited laboratories. The Consumer Product Safety Commission (“CPSC”),³⁹ on the other hand, has a less formal relationship with UL. The CPSC actively contributes to the content of UL standards in cases where the CPSC has a direct interest.⁴⁰ In other cases, the CPSC may use public feedback as a mechanism for influencing UL practices.⁴¹ UL, for its part, actively invests in the government and regulator services it offers. For example, UL makes its information and consulting services available only to regulators.⁴²

2. Telecommunications Certification: CableLabs and Telcordia

Historically, most U.S. social policy goals have been advanced through governmental regulation rather than through self- or coregulation. In fact, for decades antitrust laws in the United States have provided a significant deterrent to industry development of common standards.⁴³ European and other international companies, on the other hand, have a long-standing tradition of working together to form common solutions. In 1984, Congress passed the National Cooperative Research Act (“NCRA”) in recognition of the fact that U.S. industry can benefit through participation in collaborative standards-setting activities.⁴⁴ Accordingly, the

major effort to modernize and increase efficiency in the organization. See UNDERWRITERS LABORATORIES INC. 2003 ANNUAL REPORT 1–2 (2004), available at http://www.ul.com/info/UL_AR_2003.pdf. See also Brett Nelson, *Under Fire*, FORBES, June 21, 2004, at 103, available at http://www.forbes.com/forbes/2004/0621/103_print.html.

39. See generally U.S. Consumer Product Safety Commission Home Page, <http://www.cpsc.gov> (last visited Nov. 16, 2005).

40. The CPSC also participates in defining standards of other “voluntary” safety standards-setting organizations, such as ASTM International. See Geraint G. Howells, *The Relationship between Product Liability and Product Safety—Understanding a Necessary Element in European Product Liability through a Comparison with the U.S. Position*, 39 WASHBURN L.J. 305, 310 (2000) (describing the role of voluntary standard-setting and compliance and asserting that the CPSC works the most with the American Society for Testing and Materials, Underwriters Laboratories and ANSI). Further, the CPSC has the authority to directly regulate in cases where it sees sufficient safety risk by “issuing and enforcing mandatory standards or banning consumer products if no feasible standard would adequately protect the public.” U.S. Consumer Product Safety Commission: Frequently Asked Questions, <http://www.cpsc.gov/BUSINFO/faq.html> (last visited Nov. 15, 2005).

41. See *Underwriters Laboratories Has Been Coming Under Fire*, CONSUMERS’ RES. MAGAZINE, Jan. 2000, at 40.

42. See Underwriters Laboratories, Inc.: Regulatory Authorities, <http://www.ul.com/regulators/>; see also <https://www.ul.com/auth/codereq.cfm> (last visited Nov. 16, 2005). (noting certain materials available for purchase by regulators and what the UL calls “authorities having jurisdiction.”)

43. See generally Mark A. Lemley, *Antitrust and the Internet Standardization Problem*, 28 CONN. L. REV. 1041 (1996).

44. The National Cooperative Research Act of 1984, Pub. L. No. 98-462, 98 Stat. 1815 (codified at 15 U.S.C. § 4301)(1988) (relating to research and development joint ventures). In 1993, the law was rewritten to include production joint ventures in addition to research.

telecommunications industry has only a very recent history of group certification for equipment interoperability purposes.⁴⁵ This form of certification most directly addresses the economic motivation for certification—interoperability—which is an attribute that is both valued by buyers and difficult for them to ascertain prior to product purchase.

Cable Television Laboratories (“CableLabs”), a nonprofit research consortium founded in 1988, was formed not long after the passage of the NCRA. Funded and controlled by cable operators, generally called multiple system operators (“MSOs”), in the cable television industry, CableLabs leads the development of cable television standards, as well as provides certification and qualification testing for those standards.⁴⁶ Equipment vendors tend to ensure their designs meet CableLabs standards, and they tend to seek CableLabs certification, mainly because many MSOs require certification when making equipment purchases. MSOs, in turn, are motivated to seek out certified vendors in order to increase the supply of interoperable equipment, which makes the equipment more of a commodity—an effect observable in cable modem pricing—and promotes standardization of system design and performance. Testing is performed at CableLabs, and vendors are charged fees that range from \$50,000 to \$115,000 per product tested, depending on the standard to which conformance is being certified.⁴⁷

Telcordia Technologies, a subsidiary of Science Applications International Corporation (“SAIC”), is a descendant of Bell Laboratories by way of Bellcore.⁴⁸ The company has traditionally supplied standards, certification,⁴⁹ and other services to the regional bell operating companies, as well as to other telephone companies and their equipment suppliers. As is the case with the cable industry, telephony industry equipment suppliers pay for qualification testing so that they can meet the certification requirements of telephone operators. Among other areas of proficiency,

National Cooperative Production Amendments of 1993, Pub. L. No. 103-42, 107 Stat. 119 (codified as amended at 15 U.S.C. § 4301 (1992)).

45. See Tim McElligott, *Six Degrees of Preparation*, TELEPHONY, Oct. 16, 2000, at 48.

46. CableLabs standards include the Data Over Cable Services Interface Specification (“DOCSIS”) for cable modems and the CableHome and PacketCable specifications. See CableLabs Certification and Qualification Process, <http://www.cablelabs.com/certqual/> (last visited Nov. 15, 2005).

47. See CableLabs Pricing Schedule for 2005, *available at* www.cablemodem.com/downloads/2005Pricing.pdf (last visited Nov. 15, 2005) (explaining pricing for various certification processes).

48. Bellcore was established from parts of Bell Labs during the AT&T divestiture in 1984, and SAIC bought the organization in late 1998. Bill Pitterman, *Telcordia Technologies: The Journey to High Maturity*, 17 IEEE SOFTWARE 4, July/Aug. 2000, at 89.

49. See Testing Services, Telcordia Network Integrity Services, http://www.telcordia.com/services/testing/ntwk_integrity.html (last visited Nov. 15, 2005).

Telcordia inherited unique expertise in certifying the interoperability of products with Bell company operations and management databases.

In recent years, Telcordia and the company's proprietary Operations Systems Modifications for the Integration of Network Elements ("OSMINE") process have engendered sharp criticism due to the high cost of testing—as much as \$2 million per product—and the long duration of test cycles.⁵⁰ As a result, the largest regional bell operating company, Verizon, created its own accreditation program and ten labs, including Telcordia's lab, which are currently accredited to certify compliance against standards important to Verizon.⁵¹ In this case, a large firm, rather than the government, has made an investment in an attempt to create a competitive market for interoperability-oriented certification testing. Moreover, Telcordia now has to compete for certification business. Accordingly, Telcordia's business strategy has shifted away from providing sole-source research and certification—as was the case in the Bellcore era and as is similar to the case with CableLabs⁵²—towards providing a broad array of services and technologies.

3. Meta-Standard Certification: ISO 9000

Nations may identify accrediting bodies that in turn accredit certification bodies.⁵³ Not surprisingly, the details of quality systems can vary dramatically depending on the product being manufactured or the service being provided. Meta-standard certification, then, is an attempt to provide useful certification across a very diverse and heterogeneous set of circumstances by focusing on process clarity rather than specific outcomes.

50. Dan O'Shea, *A Certified Mess*, TELEPHONY, Jan. 21, 2002, at 32, 34.

51. See Verizon Independent Testing Laboratories Network Equipment Building System NEBS Testing Certification Program (NEBS-TCP), <http://www.verizonnebs.com/toppage.html> (last visited 15, 2005).

52. The transition of Bellcore from a consortium to a supplier was partly due to increasing competition between the consortium's member regional bell operating companies. Such competition undermines the viability of consortia. See Pitterman, *supra* note 48, at 89.

53. In the United States, three bodies are designated as accrediting bodies: the American National Accreditation Program for Registrars of Quality Systems, the American National Standards Institute, and the Registrar Accreditation Board. See ISO Directory of ISO 9000 and ISO 14000 Accreditation and Certification Bodies, http://www.iso.ch/iso/en/info/ISODirectory/Country/country_US.html (last visited Nov. 15, 2005). Also see Maureen A Breitenberg, *The ABC's of the U.S. Conformity Assessment System*, Office of Standards Systems, NIST, NISTR 5014 (April, 1997), available at <http://ts.nist.gov/ts/htdocs/210/ncsci/primer.htm> (last visited Nov. 15, 2005). National accrediting bodies may themselves be accredited by a common international organization such as the International Accreditation Forum. See International Accreditation Forum Home Page, <http://www.iaf.nu/> (last visited Nov. 15, 2005). Note that ISO itself does not accredit any organization relative to accreditation or certification.

One management practice meta-standard is the International Standards Organization ("ISO") 9000 series of standards, which prescribes quality systems and their documentation and management, typically for manufacturers, although the series has been applied to service providers as well.⁵⁴ A firm seeking certification creates and documents a quality system that is both specific to its own activities and in conformance with ISO 9000 series principles. An ISO 9000 certification body (e.g., a commercial firm offering auditing, certification, and consulting) then audits the firm to verify system conformance with the standard and with system documentation.⁵⁵

Companies adopt ISO 9000 for the following reasons: to meet customer certification requirements (particularly those of public sector customers), to reduce the possibility of product liability, and to increase the utility of quality improvement programs in general—consistent with the theme, broadly developed in the mid-1980s through the mid-1990s, that quality improvement increases a firm's profitability.⁵⁶ ISO 9000 certification has grown into its own industry, one that employs numerous consultants, trainers, auditors, and registrars.⁵⁷

As became apparent by the late 1990s, however, the correlation between ISO 9000 certification and product quality is weaker than could be hoped. Task forces in the UK evaluated this phenomenon and determined that this disparity is the result of variable quality among the broad array of certifying agencies.⁵⁸ In other words, certification of a quality system does not necessarily take into account the possibility that commitment to the quality process may decrease post-certification or that certification may be viewed as a hurdle to cross rather than as a new quality approach that should be assimilated into the operation and culture of the organization. Recommended changes to the ISO 9000 regime include calls to (1) reduce the number of accredited registrars so that more effort can be spent on accreditation; (2) use product and quality system certifications in combination; and (3) recognize the value of just-in-time practices.⁵⁹ Some of these changes are reflected in the more recent ISO 9001:2000

54. Mustafa V. Uzumeri, *ISO 9000 and Other Metastandards: Principles for Management Practice?*, ACAD. OF MGMT. EXECUTIVE Feb. 1997, at 21, 27.

55. See James C. Bruno and Brett D. Bynnonen, *Legal Implications of ISO 9000 under the UCC*, 75 MICH. B.J. 1076 (Oct. 1996) (describing the general scope of ISO 9000).

56. Norman Burgess, *Lessons Learned in Quality Management—A Rational Role for Certification*, IEEE SYMP. ON PROS AND CONS OF ISO 9000 ACCREDITED CERTIFICATION, Mar. 31, 1999, at 1/1.

57. *Id.* at 1/2.

58. *Id.* at 1/1.

59. *Id.* at 1/2–1/3.

framework.⁶⁰

4. Certification for Consumers: The Wi-Fi Alliance

The Wi-Fi Alliance is a nonprofit trade association founded in 1999 and organized by equipment and component providers interested in the market for IEEE 802.11 wireless local access network equipment. The alliance had more than 200 member companies by July 2004, and it certified interoperability of more than 1,500 products between March 2000 and July 2004.⁶¹ As with a number of other consortia, the alliance is intended to augment an otherwise established standards process—in this case, IEEE wireless networking—by providing interoperability certification and by building a consumer brand in order to ensure interoperability of purchased products.⁶² The Wi-Fi Alliance accredits independent testing labs as Wi-Fi Interoperability Certification Labs.⁶³ These labs report results to the Wi-Fi Alliance, which in turn grants certification and the right to display appropriate Wi-Fi logos.⁶⁴ While only Wi-Fi members can request certification, the association's wide membership suggests that barriers to membership are low; in other words, the association does not seem to substantially restrict entry in order to limit competition.

5. Self-Regulation and Voluntary Agreements in Environmental Policy

Environmental regulation has seen the most active experimentation in self-regulation of any area of social policy. A sequence of environmental disasters (e.g., Bhopal, Exxon Valdez, Three Mile Island) and a set of vocal nongovernmental organizations ("NGOs") combine to represent public environmental interests, but recent neoliberal trends towards deregulation recognize both the direct and indirect costs of command-and-control regulation. The result has been a wave of self-regulatory experiments in which firms and industries enter into voluntary agreements to reduce

60. L. Paul Dreyfus, Sanjay L. Ahire, & Maling Ebrahimpur, *The Impact of Just-in-Time Implementation and ISO 9000 Certification on Total Quality Management*, 51 IEEE TRANSACTIONS ON ENGINEERING MGMT. 125, 125 n.1 (2004); E. Davies & M. Whyman, *ISO 9000:2000—New ISO, New Responsibilities for Top Management*, ENGINEERING MGMT. J. (U.K.), Oct. 2000, at 244; see also Eitan Naveh & Alfred A. Marcus, *When Does the ISO 9000 Quality Assurance Standard Lead to Performance Improvement? Assimilation and Going Beyond*, 51 IEEE TRANSACTIONS ON ENGINEERING MGMT. 352 (2004).

61. See Wi-Fi Alliance, *Wi-Fi Backgrounder*, <http://www.wi-fi.org/OpenSection/backgrounder.asp?TID=5> (last visited Nov. 15, 2005).

62. *Id.*

63. *Id.*

64. See *id.*

environmental impact.⁶⁵

The environmental self-regulation experience has been decidedly mixed and has resulted in a number of findings that are beneficial to our discussion of telecommunications emergency services self-regulation.⁶⁶ These findings include both theoretical and empirical evidence of the detrimental impact of free-riding on effective industry-wide voluntary agreements,⁶⁷ the importance of external stakeholder involvement in negotiating credible voluntary agreements,⁶⁸ the critical role of public monitoring of conformance with voluntary agreements by independent parties,⁶⁹ and the importance of a plausible threat of governmental regulation.⁷⁰

6. Certification Evolves: Telecommunications Certification Bodies

Until the late 1990s, the regulatory procedure for standardizing and certifying devices for sale to the general public under FCC rules had not changed significantly. For example, a company that wanted to market devices that connect to the telephone network under Part 2⁷¹ or Part 68⁷² of

65. See Thomas Dietz & Paul C. Stern, *Exploring New Tools for Environmental Protection*, in *NEW TOOLS FOR ENVIRONMENTAL PROTECTION: EDUCATION, INFORMATION, AND VOLUNTARY MEASURES* 3, 5 (Thomas Dietz & Paul C. Stern eds., 2002); Frank Convery & François Lévêque, *Applying Voluntary Approaches—Some Insights from Research*, in *RESEARCH IN ENVIRONMENTAL VOLUNTARY APPROACHES: RESEARCH INSIGHTS FOR POLICY-MAKERS FROM THE POLICY WORKSHOP ON THE USE OF VOLUNTARY APPROACHES* 65, 66 (Charles J. Higley & François Lévêque eds., 2001).

66. See T. Lookabaugh & D. C. Sicker, *Self-Regulation of E911 for VoIP: Lessons for the Cable Industry from Environmental Voluntary Agreements*, MAGNESS INSTITUTE ACADEMIC SEMINAR, San Francisco, CA, 2005.

67. See Andrew A. King & Michael J. Lenox, *Industry Self-Regulation without Sanctions: The Chemical Industry Responsible Care Program*, 43 *ACAD. OF MGMT. J.* 698 (2000) (discussing industry self-regulation and the difficulty in maintaining it without specific sanctions); see also Jorge Rivera & Peter de Leon, *Is Greener Whiter? Voluntary Environmental Performance of Western Ski Areas*, 32 *POL'Y STUD. J.* 417 (2004) (analyzing a voluntary environmental initiative that lacked oversight and sanctions for poor performance resulting in a worse outcome).

68. See JoAnn Carmin, et al., *Stakeholder Involvement in the Design of U.S. Voluntary Environmental Programs: Does Sponsorship Matter?*, 31 *POL'Y STUD. J.* 527 (2003).

69. See Kathryn Harrison & Werner Antweiler, *Incentives for Pollution Abatement: Regulation, Regulatory Threats, and Non-Governmental Pressures*, 22 *J. POL'Y ANALYSIS & MGMT.* 361 (2003).

70. See Madhu Khanna, *Non-Mandatory Approaches to Environmental Protection*, 15 *J. ECON. SURVEYS* 291, 318 (2001); Anna Alberini & Kathleen Segerson, *Assessing Voluntary Programs to Improve Environmental Quality*, 22 *ENVTL. & RESOURCE ECON.* 157, 178 (2002).

71. Frequency Allocations and Radio Treaty Matters; General Rules and Regulations, 47 C.F.R. § 2 (2004).

72. Connection of Terminal Equipment to the Telephone Network, 47 C.F.R. § 68 (2004).

the FCC rules (described below) had to first complete a series of tests, which were either performed in the company's own laboratory or outsourced to a third party. The actual testing process tended to take anywhere from one day to one week, and the test results had to be submitted to the FCC. The centrally controlled FCC approval process took up to three months, and the device could not be properly marketed in large commercial applications until it received FCC approval. The above example highlights the FCC's device-level command-and-control approach.

The questions, then, are these: what are these FCC rules, and why is device certification relevant in this context? The answer to these questions is simple: virtually every device that connects to the network must meet certain FCC specifications before it can appear on the market. FCC Part 2, for example, is a massive collection of technical data spanning several hundred pages. It covers international regulations, nomenclature and assignment of frequencies, and the complete table of frequency allocations.⁷³ FCC Part 68, in turn, regulates the connection of terminal equipment to the telephone network, and any device that is regulated under Part 68 (e.g., the limits set for intentional and unintentional radiation) must also comply with the provisions of Part 15.⁷⁴ Part 68 is important for future wireless applications because any change in FCC regulations or policy is likely to affect all interrelated FCC compliance regulations simultaneously. In the VoIP area, as we will see, new Internet-enabled telephones will easily span all of these areas and will require certification under many different parts of the FCC rules.

Indeed, even the most banal wireless applications, such as cordless phones, are regulated under Part 68 for their connection to the network,⁷⁵ Part 15 for their radiation limitations in a broadcasting capacity,⁷⁶ and Part 2 for their placement in the frequency allocation zoning map.⁷⁷ In fact, future technologies—like VoIP devices—are likely to dramatically increase the complexity involved in adhering to FCC regulations. For example, regulators used to be able to categorize transmitters and receivers with relative ease in a bygone era when television and radio were the primary subjects of regulation. Today, however, new technological advances are supplanting these categorizations, and hybrid applications no longer fit neatly within any single FCC provision. Examples of these

73. 47 C.F.R. § 2 (2004).

74. *See* 47 C.F.R. § 15 (2004).

75. *See* 47 C.F.R. § 68.2(a) (2004).

76. 47 C.F.R. § 15 (2004).

77. *See* 47 C.F.R. § 2 (2004).

recategorizations include frequencies originally intended for UHF television that have been reallocated for cellular⁷⁸ and frequencies originally intended for garage-door openers⁷⁹ that are now used for cordless phones, wireless in-home local area networks (“LAN”), car alarms, and electronic dog fences. Categorization is quickly losing its meaning, and future regulations will likely have to address purely technical criteria rather than application-specific criteria. Although VoIP is sometimes characterized as a revolutionary technology, in terms of its development it is merely one of several hundred new devices or products entering the marketplace.

In 1998, the FCC anticipated that its rules would not be able to keep up with technological advancements, and it shifted away from its traditional command-and-control paradigm by adopting ET Docket 97-94.⁸⁰ The FCC’s action amended certain rules in order to (1) simplify our existing equipment authorization processes; (2) deregulate the equipment authorization requirements for certain types of equipment; and (3) provide for electronic filing of applications for equipment authorization. The proposals were designed to reduce the burden of the equipment authorization program on manufacturers.⁸¹

As a result, the FCC shifted the regulatory burden for approval of various devices to the private sector.⁸² The thrust of this action was to organize a provision for so-called Telecommunications Certification Bodies (“TCBs”), whose objective is to conduct various tests and certifications following essentially the same criteria previously employed by the FCC.⁸³ Another component of this plan was the adoption of Mutual

78. See Inquiry Relative to the Future Use of the Frequency & 806-960 MHz, 46 F.C.C.2d 752 (1974) (discussing the rulemaking procedure that deals with reallocation of UHF channels for cellular telephone services).

79. The 2.4 GHz frequency band was originally designated for home devices. The 2.4 GHz band now includes everything from wireless networking to invisible dog fences. See Kenneth R. Carter et al., *Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues* 3, 16 (FCC Office of Strategic Planning and Policy Analysis, OSP Working Paper No. 39, May 2003), available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-234741A1.pdf (describing in pages 1-4 the wide range of uses for unlicensed wireless devices).

80. Amendment of Parts 2, 15, 18 and Other Parts of the Commission’s Rules to Simplify and Streamline the Equipment Authorization Process for Radio Frequency Equipment, *Report and Order*, 13 F.C.C.R. 11415 (1998), available at <http://www.fcc.gov/oet/dockets/et97-94/> (follow “original order text” hyperlink).

81. *Id.* para. 3.

82. See 1998 Biennial Regulatory Review—Amendment of Parts 2, 25, and 68 of the Commission’s Rules to Further Streamline the Equipment Authorization Process for Radio Frequency Equipment, *Report and Order*, 13 F.C.C.R. 24687 (1998) [hereinafter *Implement Mutual Recognition Agreements Report and Order*].

83. TCBs are now captured in 47 C.F.R. § 2.960 (2004), and they are described on the

Recognition Agreements (“MRAs”) to allow foreign parties to evaluate equipment conformance with U.S. technical requirements.⁸⁴ The process for approval under the new regulation is quite simple, and many expect it to have an important effect on domestic and international commerce. The case may be most significant in terms of international commerce, where European organizations have enjoyed advances in standardization through Europe-wide groups like European Telecommunications Standards Institute (“ETSI”)⁸⁵ and European Committee for Electrotechnical Standardization (“CENELEC”),⁸⁶ and through country-specific groups like AFNOR (France),⁸⁷ the famous TÜV (Germany),⁸⁸ and others. If a U.S. company wants to market a new device to the European Union, the company must seek out a Conformity Assessment Body (“CAB”) under Article 10(2) of the Electromagnetic Compatibility Directive.⁸⁹ A CAB⁹⁰ is similar to a TCB in the United States. The European CAB then issues a “Technical Construction File,” which consists of a technical judgment regarding the overall compliance of a product. If the company receives a judgment in its

FCC Web site as follows: The FCC may designate a TCB to process an application to determine whether the product meets the Commission’s requirements and shall issue a written grant of equipment authorization. A TCB may authorize such devices subject to certification as the FCC except new technology devices or devices with unique radio frequency (“RF”) safety concerns. FCC Equipment Authorization, <http://ftp.fcc.gov/oet/ea/procedures.html> (last visited Nov. 15, 2005).

84. *Implement Mutual Recognition Agreements Report and Order*, *supra* note 82, para. 19 n.36 (“The model APEC MRA provides that countries will identify the relevant regulations and requirements at the time they enter into bilateral agreements.”).

85. See ETSI Home Page, www.etsi.org (last visited Nov. 15, 2005). ETSI was born out of the development of Global System for Mobile Communications (“GSM”) standards across Europe. See generally Howard A. Shelanski, *Competition Policy for Mobile Broadband Networks*, 3 J. TELECOMM. & HIGH TECH. L. 97, 111–12 (2004) (describing GSM and its relationship with ETSI).

86. See CENELEC Home Page, www.cenelec.org (last visited Nov. 15, 2005). See also Suzanne Laplante, *The European Union’s General Product Safety Directive: Another Call for U.S. Exporters to Comply with the ISO 9000 Series*, 22 SYRACUSE J. INT’L L. & COM. 155 (1996) (describing the role of various standards-setting organizations in Europe and their relationship with certification programs like ISO 9000).

87. See Groupe AFNOR Home Page, <http://www.afnor.fr/portail.asp?Lang=English> (last visited Nov. 15, 2005). See also Lori M. Wallach, *Accountable Governance in the Era of Globalization: the WTO, NAFTA and International Harmonization of Standards*, 50 U. KAN. L. REV. 823 (2002) (describing AFNOR and other state-run standards-setting organizations in Europe and elsewhere).

88. See TÜV Rheinland Group Home Page, www.tuv.com (last visited Nov. 15, 2005).

89. Council Directive 89/336/EEC, art. 10, 1989 O.J. (L 139) 19, 22 (EEC), available at http://europa.eu.int/comm/enterprise/electr_equipment/emc/directiv/89_336_eeec.pdf.

90. See John Bengston, *Connecting Terminal Equipment Under the New EC Regs*, COMPUTER LAWYER, July 1992, at 32, 32. The Article outlines the early challenges and regulations facing the European Community. The Article may be somewhat outdated now, but it highlights the challenges of setting up uniformity in the pre-GSM European climate in the early 1990s.

favor, then the device receives the coveted “CE” mark,⁹¹ which can be seen on virtually all electronic devices sold worldwide.⁹²

Since roughly 1998, the European process and the U.S. process have grown increasingly similar, and certification bodies and their processes are themselves beginning to standardize on both sides of the Atlantic. In both the European Union and the United States, companies with approved telecommunications devices are expected to keep their certification reports on file in each country where the devices are sold, and the reports must stand up to scrutiny if device approval is ever questioned. A CAB-certified (Europe) or TCB-certified (United States) device may pass all tests, but if a report does not meet with inspector approval or if incorrect test data is discovered, the company in question may be forced to suspend shipments until it presents acceptable proof of conformity. In addition to receiving certification, devices must thus be able to sustain audit.

7. An Expanded Role for Enforcement

It is within this latter inspection and policing capacity that the FCC will continue to perform its own independent surveillance of products on the market⁹³ using random product testing mechanisms and other procedures to investigate allegations of noncompliance.⁹⁴ Ultimately, however, the certification process of the delegates (the TCBs) will help to free up FCC resources, marking the beginning of an ongoing shift in the role of the FCC from command-and-control regulation to *ex post* enforcement functions. Nonetheless, the FCC remains responsible for issuing certifications to TCBs,⁹⁵ which is a responsibility that it shares in

91. “The letters ‘CE’ are the abbreviation of French phrase ‘Conformité Européene’ which literally means ‘European Conformity.’ The term initially used was ‘EC Mark’ and it was officially replaced by ‘CE Marking’ in the Directive 93/68/EEC in 1993.” What is CE Marking (CE Mark)?, *available at* <http://www.ce-marking.org/what-is-ce-marking.html> (last visited Nov. 15, 2005).

92. See the European Union’s Web site on Electrical Equipment, *available at* http://europa.eu.int/comm/enterprise/electr_equipment/index_en.htm (last visited Nov. 15, 2005).

93. For a discussion of changes made and policing functions (including fines), see David E. Hilliard & Kurt E. DeSoto, *FCC Refines Computer Marketing Regulations*, COMPUTER LAWYER, Sept. 1992, at 27, 28-29. The Article discusses the expansion of enforcement at the FCC level:

[In 1992, the FCC] substantially expanded the enforcement of its computing device marketing rules The penalties for marketing unauthorized or improperly tested computers or computer peripherals increased [to] . . . (1) civil forfeitures of \$75,000 for continuing violations and \$10,000 each for other violations; (2) criminal penalties as high as \$500,000 in fines and two years in prison; (3) civil litigation; and (4) equipment confiscation. *Id.* (citation omitted).

94. *Implement Mutual Recognition Agreements Report and Order*, *supra* note 82.

95. See Accreditation of Telecommunications Certification Bodies (TCBs) and

certain cases with the National Institute of Standards and Technology,⁹⁶ and the aforementioned rules allow either the TCB or the FCC to revoke the interconnection authorization of terminal equipment. Thus, the FCC still retains an important role in enforcement control, and it may even revoke equipment placed on the market after authorization has been acquired by a TCB.⁹⁷ The law requires the FCC to prove that (1) the equipment approval has been obtained by misrepresentation; (2) the approved equipment causes harm to the public switched telephone network; (3) the responsible party willfully or repeatedly fails to comply with the terms and conditions of its equipment approval; or (4) the responsible party willfully or repeatedly fails to comply with any FCC rule, regulation, or order relating to terminal equipment under the Communications Act of 1934.⁹⁸

It is not yet known if the enforcement arm of the FCC will prove effective, especially in cases where a TCB certifies the commercial application of a product that subsequently interferes with other entities. Bell Atlantic raised this issue, contending that foreign certification of equipment could introduce partiality into the authorization process and lead to inconsistent application of standards.⁹⁹ Nonetheless, anecdotal evidence suggests that the increasing number of FCC representatives at events, such as COMDEX,¹⁰⁰ where new technologies are often shown to the public,¹⁰¹ demonstrates the organization's willingness to embrace its enforcement role.

The more pressing question, however, is how will the FCC actually go about setting up deterrents to prevent wrongs, such as the proliferation of an inexpensive, uncertified VoIP device that enters the market and takes

Certification Bodies (CBs) under the Mutual Recognition Arrangement (MRA), National Institute of Standards and Technology Web site, <http://ts.nist.gov/ts/htdocs/210/gsig/tcb-program.htm> (last visited Nov. 15, 2005).

96. See 1998 Biennial Regulatory Review, *Notice of Proposed Rule Making*, 13 F.C.R. 10683, para. 15 (1998), available at http://www.fcc.gov/Bureaus/Engineering_Technology/Notices/1998/fcc98092.pdf (“[W]e anticipate that circumstances may arise where it may be necessary to suspend or revoke a TCB’s certification authority.”) [hereinafter 1998 Biennial Regulatory Review]; see also *Implement Mutual Recognition Agreements Report and Order*, *supra* note 82.

97. 1998 Biennial Regulatory Review, *supra* note 96, paras. 13–14.

98. *Id.* para. 15.

99. See *id.* para. 11 (discussing Bell Atlantic’s opposition).

100. COMDEX is a major technology fair that, until recently, was held annually in Las Vegas. In 2004, the organizers cancelled the event for the first time because of poor participation from vendors. See Jim Carlton, *Comdex’s Organizers Cancel This Year’s Show in Las Vegas*, WALL ST. J., June 24, 2004, at B9.

101. See Hilliard & DeSoto, *supra* note 93, at 29 (stating that in fall 1991 the FCC issued more than 100 violations to vendors who exhibited unauthorized computer equipment at COMDEX).

off rapidly? It may be difficult or even impossible to recall all of the devices, especially if they realize major sales within a short period of time, such as during the Christmas season. The device manufacturers could be sham organizations purchased through international e-commerce portal sites—or even offshore companies—making them very difficult to monitor from the FCC's point of view. Only through efficient delegation to third-party authorities (e.g., the TCBs) will the FCC have any opportunity to allocate the resources needed to police the proliferation and e-commerce distribution of new technologies.

8. Certification Processes

Each of the preceding examples involves a certification process from which we can abstract the following common and desirable elements:

(1) Pre-Certification. Certification processes, expectations, and procedures are well-documented, and certification officials have easy access to educational and background materials. If the certification process is sufficiently complex, a third-party community of trainers, consultants, and test equipment providers will participate in certification activities. The goal is to facilitate a standard, straightforward, and repeatable process. Fees are documented, predictable, and reasonable.

(2) Certification. Testing and evaluation against the certification criteria takes place. Certification of easily transportable equipment occurs at specified test facilities, preferably facilities that are conveniently, or even regionally, located. Certification teams go on-site to test equipment that is non-transportable and to evaluate facilities, infrastructures, or processes. Testing is prompt and transparent, and it follows designated guidelines.

(3) Post-Certification. The certifying authority follows a clear process that clarifies deadlines and formats for reporting test results. The reasons for any failures are clearly documented, and comments and recommendations are suggested. The certifying authority follows a clear and transparent procedure for questioning and appealing results and for publicizing successful certification, both by the certifier and by the certified body. A publicly accessible database contains successful certification results. The certification authority documents and institutes a periodic follow-up reinspection process.

C. Implications for VoIP Emergency Services Certification

We can make several general observations about VoIP emergency services certification based on the preceding theories and specific examples of certification. These observations will then inform specific recommendations provided in Part VI. To begin, certification of emergency

service capabilities for VoIP better fits the category of certification for social policy goals than certification for economic reasons, mainly because firms have not traditionally been able to charge consumers for 911 services.¹⁰² The implication is that standards and related certification bodies are not likely to arise unless they are naturally driven by the industry's own economic interest—as is the case with TCBs, such as Telcordia, CableLabs, and Wi-Fi Alliance.

General evidence suggests that social policy self-regulation requires strong external motivation. In the case of VoIP emergency services, associations of public safety officials, such as the National Emergency Number Association (“NENA”) and the Association of Public Safety Communications Officers (“APCO”), already play an active role in prompting self-regulatory discussions.¹⁰³ However, the effectiveness of this external motivation is seemingly derived largely from the presumption that these organizations have the ears of regulators at the local and federal levels. For example, no truly separate nongovernmental organizations play an active regulatory role (e.g., by influencing consumers). Hence, it appears likely that government influence, either direct or indirect, is needed in this case. Such influence can naturally take a number of forms. The government could inspire self-regulation through the credible threat of potential regulation, or it could actively share regulation responsibilities with social policy organizations. Moreover, although the FCC is the most obvious choice to take the reins of such social policy regulatory initiatives, government influence could also come from state agencies—assuming they can be sufficiently coordinated to be effective—or from a combination of federal and state agencies.

In short, social policy self-regulation faces a credibility challenge. Consequently, certification processes should not be held captive to the certifying body, which could make the standards subject to use in extracting monopoly rents (e.g., by restricting industry participation) or could induce the standards to be set at inappropriate performance levels.¹⁰⁴ One option here is the use of a broad-based standards-setting organization that openly invites the participation of other parties, such as government

102. Firms subject to rate regulation may remain relatively neutral toward the imposition of 911 requirements if they are able to recover costs through a general increase in prices. However, we expect many firms involved in VoIP to be excluded from rate regulation and consequently motivated to avoid costs without offsetting revenues unless other issues, such as the threat of government regulation, arise.

103. See National Emergency Number Association Web site, http://www.nena9-1-1.org/VoIP_IP/index.htm (last visited Sept. 30, 2005); see also APCO International Web site, <http://www.apcointl.org> (last visited Nov. 16, 2005).

104. As noted earlier, standards can be set too high in an effort to restrict competition or too low in an effort to reduce industry costs at the expense of overall welfare.

and consumer organizations. In parallel, it would be valuable to create a hierarchy of trust of accrediting certifiers, whereby the root accrediting organization remains credibly independent of the certified companies. This role of the root accrediting organization can be played by the government, as in the case of OSHA, or by a sufficiently independent group of institutions, as in the case of the ISO 9000 series of standards. The role should probably not be played by a major industry firm, as in the case of Verizon's testing certification lab, or by a tightly controlled industry consortium.¹⁰⁵

Many certification processes that involve conformance testing are overseen by a competitive market of certifiers (e.g., product safety certification, telephone company product interoperability certification, and ISO 9000 quality system certification). Such an approach may work for VoIP emergency services certification as well. Note, though, that implementation of this approach would reinforce the need for a hierarchy of accreditation so that the certifiers' capabilities can be trusted.

Furthermore, VoIP emergency services certification is likely to consist mainly of software certification. Here, it would be wise to encourage certification processes that engage with software development throughout its cycle rather than solely at the cycle's end. Also, some aspects of VoIP emergency service performance will depend on network and system characteristics that can be expected to vary widely among VoIP providers. An element of system meta-management standardization and certification, similar to ISO 9000, may be appropriate in such heterogeneous circumstances, but we need to learn from the ISO 9000 experience so that we do not rely solely on process certification to control outcomes.

In fact, consumers can play a key role in discriminating between certified and noncertified firms and between different levels of certification through their buying choices. Examples of such consumer involvement include certification by UL and the Wi-Fi Alliance. However, for the certification to be effective, consumers need to be aware of the certification's implications and confident in its legitimacy, thus implying an investment in consumer awareness and in policing inappropriate assertions of certification. These functions can be accomplished through the combined efforts of the government and industry trade associations (e.g., the Wi-Fi Alliance), both of which create a brand around

105. While the Wi-Fi Alliance is clearly a membership-restricted industry consortium, it nonetheless has a fairly open membership policy and therefore does not tightly control the behavior of its members. However, even an organization with broad industry membership risks the possibility that opaque and self-interested policies, the kind that are sufficient to undermine credibility, could be implemented.

certification, obtain legal rights to certification marks, and prosecute infringers. Further, individual certified firms, which are generally motivated to promote the significance of certification in order to differentiate themselves from noncertified firms, could also accomplish these functions.

Finally, careful consideration of the role of insurance and liability mitigation could accelerate regulatory progress and industry participation beyond that which would be naturally motivated by the threat of government regulation. Here again, government involvement can potentially help. For example, governmental roles, such as setting appropriate standards and serving as the root accrediting body for certifiers, can enhance the status of standards and the broad acceptance of certification. Insurance industry participation in standards setting and in institutional design of certification is also desirable if it leads to differential premiums for industry participants based on certification.

III. TECHNOLOGY ASSESSMENT

This Part provides a technology assessment of VoIP emergency services based on a classification of fundamental trends in technology and protocol models. It will begin by reviewing the basic operations and functions of today's emergency services. Next, it will discuss the engineering and operations of VoIP systems. Finally, it will describe how VoIP emergency services might be implemented and offer a set of possible (preliminary) VoIP emergency services requirements.

A. Emergency Services and the PSTN

In the context of the PSTN, emergency services in the United States have long been known by the dialing convention 911.¹⁰⁶ When this number is dialed, an emergency call is routed to the appropriate public safety answering point ("PSAP") and then routed to fire, medical, or law enforcement agencies, as appropriate. Enhanced 911 ("E911") added a capability that enables the emergency services dispatcher to see the calling number and information about the caller's location. Regulations imposed on emergency services obligations vary across services, technologies, and local, national, and international borders.¹⁰⁷ In the United States, certain

106. See generally FCC, 911 Services, <http://www.fcc.gov/911> (last visited Nov. 16, 2005).

107. Although common in many respects, emergency services regulation in the European Union differs from emergency services regulation in the United States. A simple but obvious difference is the emergency number itself: 911 in the United States, 112 in Europe. Commission Recommendation 2003/558, On the Processing of Caller Location Information in Electronic Communication Networks for the Purpose of Location-Enhanced Emergency

carriers are required to support 911 service under the 911 Act,¹⁰⁸ with regulatory responsibility divided among federal, state, and local authorities.¹⁰⁹

With traditional E911, the initial routing of a 911 call is provided by the central office, which uses a routing database to associate the caller with the appropriate PSAP. E911 provides calling number information in the Automatic Number Identification (“ANI”) and location information in the Automatic Location Information (“ALI”), and it assumes that the PSAP that receives the call is geographically related to the call origination location. This routing process is accomplished using a selective router database search. The PSAP then accesses a Public Safety-Automatic Line Information (“PS-ALI”) database to associate the calling number with a physical location. At this point, the PSAP may forward the call to an emergency call center, which performs another database search on a database maintained by the telephone company to associate the caller’s phone number with a particular location.¹¹⁰

B. Emergency Services and Wireless

Many of the problems facing VoIP emergency services are similar to those of emergency services for commercial mobile radio service, wireless telephony. Although the technologies are different, some of the same solution mechanisms apply. For example, the development and adoption of wireless emergency service solutions followed a long and convoluted path.¹¹¹ While many of the issues that arose were attributed to technical uncertainty due to an inadequate level of technical understanding early in

Call Services, 2003 O.J. (L 189) 49 (EC), available at http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_189/l_18920030729en00490051.pdf.

108. See Implementation of 911 Act; The Use of N11 Codes and Other Abbreviated Dialing Arrangements, *Fifth Report and Order, First Report and Order, Memorandum Opinion and Order on Reconsideration*, 16 F.C.C.R. 22,264 (2001).

109. For example, the 911 Act requires the FCC to take a leadership and support role in implementing wireless 911, but the Act does not give the FCC the authority to regulate statewide plans. See Federal Communications Commission: State 911 Deployment Plans, <http://www.fcc.gov/911/stateplans/about.html> (last visited Nov. 16, 2005).

110. See generally, Aaron Futch & Christine Soares, *Enhanced 911 Technology and Privacy Concerns: How Has the Balance Changed Since September 11 2001?*, Duke L. & Tech. Rev. 38 (2001) (describing the basic principles of E911 functionality).

111. See Dale N. Hatfield, Adjunct Professor, Univ. of Colorado at Boulder, Keynote Address at the IEEE International Symposium: Challenges of Network Design in an Increasingly Deregulated, Competitive Market (Mar. 27, 2003), available at http://www.ieee-im.org/2003/presentation%20files/RemarksDH_IM2003.doc. See also DALE N. HATFIELD, A REPORT ON THE TECHNICAL AND OPERATIONAL ISSUES IMPACTING WIRELESS ENHANCED 911 SERVICES, 2002, available at http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6513296239 (last visited Nov. 16, 2005).

the process, a significant number of the delays were the direct result of industry resistance caused by the absence of strict timelines. Another issue to consider is whether or not certain policy approaches might hasten the development effort. In the wireless emergency services regulatory process, the FCC played a substantial role in specifying and assessing the technical characteristics of the location technology. This initiative consumed considerable time. An industry-led specification and assessment might have hastened this process, particularly if regulatory agencies had monitored the process and set deadlines.

Another issue to consider is that of the implementation itself. Wireless emergency services made use of a phased implementation approach that considered short-term versus long-term solutions. Such an approach can help to promote interim solutions and allow for the creation of reasonable timelines for long-term solutions.¹¹²

One important lesson worth considering is this: past regulations should not necessarily be used to define future policy. Different technologies operate in different ways, and these variations can lead to the development of new capabilities and features. For example, as Henning Schulzrinne points out, VoIP offers a number of advantages over voice telephony, including higher resilience, faster call setup, accessibility support, multimedia support, greater cost efficiency, more call data, no telephone reliance, and greater competition.¹¹³ In addition, unlike traditional telephony, IP phones do not need to associate with a local central office, and they have little to no need for explicit voice service providers. Instead, the functions of the provider are dispersed and require minimal provider assistance.¹¹⁴ The development of policies that do not appreciate such differences could signal the loss of technical opportunities to better serve society.

112. An FCC news release describes the obligations imposed on certain carriers in terms of providing emergency services. The regulations on carriers are imposed in two phases: the E911 first phase requires carriers to report the wireless caller's phone number at the location of the antenna that received the call, and the E911 second phase requires wireless carriers to provide the precise location of a 911 caller within 50 to 100 meters. Deployment of the second phase began in October 2001 and is scheduled for completion by December 31, 2005. See Press Release, FCC, FCC Expands E911 Rules (Nov. 13, 2003), http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-241214A1.pdf.

113. See Henning Schulzrinne, *9-1-1 Calls for Voice-Over-IP: Ex-Parte Filing for Docket 94-102*, 3-4, Feb. 28, 2003, available at <http://www.cs.columbia.edu/IRT/papers/emergency.pdf>.

114. See Daniel B. Garrie, Matthew J. Armstrong & Donald P. Harris, *Voice over Internet Protocol and the Wiretap Act: Is Your Conversation Protected?*, 29 SEATTLE U. L. REV. 97, 107-08 (2005) (describing the distributed fashion of VoIP calling: "Gatekeeper or call-manager devices, which authenticate users and establish connections, can physically reside on any server on the network.").

C. VoIP Technology

In simple terms, VoIP carries speech over an IP-based network.¹¹⁵ The power and complexity of VoIP come largely from its ability to separate functions that were traditionally bound together, such as transport and signaling, thereby providing many more options for each function based on ubiquitous and increasingly inexpensive IP-based networking and IP-compatible access technologies, processing, and storage.

1. VoIP Parameters

IP networks may not offer the same level of performance as circuit-switched networks for voice communications. In order to obtain a similar level of performance, we must explicitly consider specific VoIP parameters, such as encoding, delay, and transport.

On a VoIP telephone call, voice is transmitted over packet networks. This transmission requires the conversion of analog voice to a digitized form, followed by a subsequent encapsulation of the digital content into a packet technology before the content is transmitted using an access technology.¹¹⁶ The initial analog conversion process is referred to as encoding.¹¹⁷ After the analog content has been encoded into a digital format, the information is packetized with the help of a transport layer¹¹⁸

115. The difference between VoIP providers and VoIP services is worth considering. VoIP as a product can be offered much like any other software application (e.g., Microsoft Word). Some VoIP products can be installed on a PC and made to run with little or no service provider participation. Some of the simpler products include NetMeeting, which is sold by software giant Microsoft. See Microsoft Windows NetMeeting, <http://www.microsoft.com/windows/netmeeting/> (last visited Nov. 15, 2005). Vonage, a service provider, also sells a product that can be loaded onto an individual's computer. See Vonage Softphone, <http://www.vonage.com/features.php?feature=softphone> (last visited Nov. 16, 2005). Such products make use of the network to reach other end points and rely on so-called intelligence within the product (i.e., software features or information added to the product, such as through software updates). Conversely, a VoIP service provider can augment a product by including additional functionality, routing and database capabilities, security, and more. In this model, the product may still be software, or it may be a combination of physical devices and software coupled closely to the service provider.

116. See Garrie et al., *supra* note 114, at 105.

117. In digital telephony over the traditional PSTN network, voice is usually encoded using PCM-u or PCM-A, resulting in a bandwidth requirement of 56-64 Kbps. However, a variety of different compression algorithms can be applied in VoIP, providing all participating terminals have the required capability. Various algorithms can introduce quality, delay, computation, and bandwidth tradeoffs. For example, G.723.1 reduces the bandwidth usage of the call to 5.3 Kbps, but it also introduces a computational delay of 37.5 ms. See DANIEL COLLINS, CARRIER GRADE VOICE OVER IP 102 (McGraw-Hill, 2000).

118. Typically, the Real-time Transport Protocol ("RTP") adds important timing and other information relevant to voice and other time-sensitive media traffic. Next, the User Datagram Protocol ("UDP") provides limited multiplexing and data detection. Unlike its peer protocol, TCP, UDP does not provide error recovery; instead, error management is left

and passed to the access technology (e.g., Ethernet) for delivery on the network. At the other end, the digital information is retrieved and converted back into analog form, which the listener can then understand.¹¹⁹ VoIP permits a wider range of choices and tradeoffs among performance parameters than traditional PSTN. These choices and tradeoffs include the following:

(1) Distortion. Low bit rate compression may be bandwidth efficient, but it may also distort speech.

(2) Errors. Voice traffic has some degree of error tolerance (e.g., a small amount of missing information will not impact intelligibility, whereas even a small error in a financial transaction is considered intolerable). However, a high enough error rate from lost packets or errored packets degrades data intelligibility.

(3) Delay. Compression algorithms, packetization, and other stages of packet transmission induce delay. Delays in excess of 250 ms can be annoying, and long delays tend to induce a half-duplex conversation in which each party pauses for a substantial period of time after speaking to determine if the other party wants to speak.

(4) Loaded Networks and Quality of Service. Both errors and delay are affected by whether or not the networks involved in transmitting the voice are loaded (i.e., whether they are subject to traffic that occupies a substantial fraction of their capacity) and whether or not they have some form of prioritization capability (i.e., quality of service ("QoS")). Loaded networks that lack QoS typically induce long and variable delays, known as jitter, and sometimes drop packets.

(5) Echo. Echo, a traditional issue in analog telephony, can still be an issue in VoIP, depending on the design of the analog portions of the system.

(6) Power. Analog PSTN terminals can be powered by the phone network. Assuming that the phone network has backup power, the system, including 911 service, can remain operational even if the customer premises is without power. VoIP systems do not automatically have such a backup system—although, to be fair, neither do cordless phones, which are connected to the PSTN.¹²⁰

to RTP and the voice codec used. Finally, UDP packets are placed in IP packets and delivered to a specified Internet address. See generally COLIN PERKINS, RTP: AUDIO AND VIDEO FOR THE INTERNET (2003) (giving a general overview of RTP).

119. See generally R. Alex Dufour, *Voice over Internet Protocol: Ending Uncertainty and Promoting Innovation through a Regulatory Framework*, 13 COMMLAW CONSPPECTUS 471, 474–75 (2005) (providing an overview of VoIP and various tradeoffs with the PSTN).

120. See VoIP 101: Circuit Switch Technology (PSTN), <http://www.voipreview.org/101.aspx> (last visited Nov. 16, 2005) (providing an overview that compares VoIP with the

For emergency services, we are concerned with the potential impact of these characteristics on the intelligibility of calls and on users' capability to place emergency service calls during power outages.

2. VoIP Signaling

While the traditional functions of setting up and tearing down calls persist in VoIP, VoIP can augment these functions in many ways by exploiting ubiquitous IP networks and inexpensive processing and storage capabilities. VoIP signaling protocols control these functions, and these protocols continue to evolve and include several variants, which in some cases are competing variants, and in other cases, complementary. The most important variants are the Session Initiation Protocol ("SIP"), H.323, media gateway protocols,¹²¹ and a number of proprietary protocols. Here, we focus primarily on the role of SIP-based systems in supporting emergency services.

SIP,¹²² a protocol developed within the Internet Engineering Task Force ("IETF"),¹²³ provides for the establishment, modification, and termination of sessions, or calls. A SIP network generally consists of user agents, proxies, registrars, and redirect servers, all interconnected via an IP network.¹²⁴ These devices exchange messages in a process used to establish the call, and they do so in a manner analogous to the now widespread packet-signaling system used in the PSTN, Signaling System 7 ("SS7").¹²⁵

PSTN).

121. Media gateway protocols include the Media Gateway Control Protocol ("MGCP"), MEGACO and H.248. A media gateway might be used to interface between a VoIP network and the PSTN, and a media gateway controller interacts with the signaling systems in each domain and manages the configuration of the media gateway. The separation of voice processing from management and the capability to independently distribute the functions result in an architecture called softswitch. VoIP architectures, in which softswitch and interfacing to the PSTN play a substantial role, generally provide less end user control over system behavior. However, such constraints may aid in the implementation of traditional PSTN system functionality, including E911. In any case, this type of architecture will be important for a substantial period, likely measured in multiple decades, while VoIP and PSTN systems must coexist. See Cox Communications, Whitepaper: Voice over Internet Protocol: Ready for Prime Time, 9–10 (2004), <http://www.cox.com/about/NewsRoom/files/VoIPreadyMay04.pdf> (describing the basic functionalities of VoIP and a media gateway).

122. See generally J. Rosenberg et al., *SIP: Session Initiation Protocol*, IETF Network Working Group Request for Comments No. 3261 (2002), available at <http://www.ietf.org/rfc/rfc3261.txt> [hereinafter SIP RFC 3261] (representing the core Session Initiation Protocol).

123. Two IETF working groups, SIP and SIPPING, are active in the development of session-related protocols. These groups have developed various standards (Requests for Comments, or RFCs) and drafts, and SIP RFC 3261 represents the core protocol. See *id.*

124. See Session Initiation Protocol ("SIP"), <http://www.ietf.org/html.charters/sip-charter.html> (last visited Nov. 16, 2005).

125. See What is SIP?, <http://www.radvision.com/NR/rdonlyres/86D6EBD0-8C2E->

SIP could enable emergency services enhancements by providing richer information set than ANI and ALI. For example, an individual could program a VoIP device to transmit medical records or emergency contact instructions to an emergency calling center via SIP. Such functions, if considered highly desirable socially and executable at a reasonable cost, could easily become subjects of future social policy, or, as this Article suggests, self-regulation.

D. Emergency Services for VoIP

As a basis for a technical model, we turn to the work of the IETF. The IETF has developed several Internet “drafts” and “requests for comments” describing the potential operation of VoIP emergency services based on the use of SIP and associated protocols.¹²⁶ This Subpart briefly describes these works in progress and highlights areas relevant to our model. While some of these drafts will not reach maturity, a reasonable VoIP emergency services model should be discernable based on this work.

These proposed VoIP emergency services requirements are based loosely on work within the IETF:¹²⁷ (1) support a reasonable QoS connection;¹²⁸ (2) use a recognized emergency service number, the equivalent of 911, to identify an emergency call;¹²⁹ (3) route calls to the appropriate response group PSAP;¹³⁰ (4) establish a means of locating the caller;¹³¹ (5) establish a means of identifying the caller;¹³² and (6) establish a means of testing the system.¹³³ Other concerns involving security or

45B9-82E8-1A0556276106/0/RADVISIONWhatisSIP.pdf (last visited Nov. 21, 2005).

126. See The Tao of IETF: A Novice's Guide to the Internet Engineering Task Force, RFC 3160 (Aug. 2001), available at <http://www.ietf.org/tao.html> (describing the functioning of the IETF and the role of draft documents and the process for commentary).

127. H. Schulzrinne & B. Rosen, Emergency Services for Internet Telephony Systems (Oct. 18, 2004), <http://www.ietf-ecrit.org/cache/draft-schulzrinne-sipping-emergency-arch-02.txt>. Note that IETF documents are referenced, posted, and archived in different locations on the Internet.

128. We realize that this requirement is not a part of the IETF specifications and that many people will question its need. Nonetheless, if the communications cannot support the intended media, or negotiate a new media type, the rest of the emergency services mechanisms are moot.

129. See Schulzrinne & Rosen, *supra* note 127, at 5–6.

130. See *id.* at 10–11.

131. *Id.* at 6–10.

132. *Id.* at 14.

133. *Id.* at 16–17. VoIP-based emergency services users and service providers may wish to test the operation of their service. Such testing might be motivated by reconfigurations, new installations, power outages, changes in service or service provider, changes in location, or simple maintenance testing. As the industry stands today, there is no mechanism for consumers to complete a test call to E911, and the first call that consumers make is likely to be made in times of emergency. Therefore, a policy and process for testing may be

network operations are more general to VoIP, though they still may warrant consideration during the process of testing VoIP emergency service operations. Furthermore, mechanisms for privacy, authentication, authorization, and availability will be required.

We should note that much of the operation of SIP-based emergency services would rely on well-established and commonly deployed protocols, including SIP,¹³⁴ Domain Name Service (“DNS”), Real-time Transport Protocol (“RTP”),¹³⁵ and ENUM.¹³⁶ Functionality not provided within these specifications is addressed by the draft documents that establish the SIP community as resolving many of the problems associated with VoIP emergency services. A draft entitled “Emergency Services for Internet Telephony Systems,” for example, describes how SIP might be used to provide emergency services, proposes an architecture based on existing SIP features, and makes use of DNS mechanisms to provide location mapping.¹³⁷ A second draft entitled “Emergency Services URI for the Session Initiation Protocol” defines two universal emergency SIP Uniform Resource Identifiers (“URIs”), which can be thought of as emergency numbers like 911, and suggests ways to increase the likelihood of being able to contact an emergency call center.¹³⁸

Moreover, several drafts address the problem of location identification by specifying the use of object formats, privacy mechanisms, and other protocols.¹³⁹ Other drafts propose methods of conveying user

valuable.

134. See SIP RFC 3261, *supra* note 122.

135. RTP is the protocol used for carrying traffic such as voice and video on the Internet. See Henning Schulzrinne et al., RTP: A Transport Protocol for Our Real-Time Applications (Jan. 1996) (unpublished paper, available at <http://www.ietf.org/rfc/rfc1889.txt>).

136. ENUM is a domain name service that supports the translation between Internet addresses, or URLs, and telephone numbers. See generally ENUM Home Page, www.enum.org (last visited Nov. 16, 2005).

137. See Schulzrinne & Rosen, *supra* note 127.

138. See Henning Schulzrinne, Emergency Services URI for the Session Initiation Protocol (Feb. 2004) (unpublished paper, available at <http://www.cs.columbia.edu/sip/draft/sos/draft-ietf-sipping-sos-01.html>).

139. See generally J. Peterson, A Presence-based GEOPRIV Location Object Format (May 2004) (GEOPRIV, working paper), available at <http://www.ietf.org/proceedings/04aug/1-D/draft-ietf-geopriv-pidf-lo-02.txt>; J. Polk, Requirements for Session Initiation Protocol Location Conveyance, (Feb. 2003) (Cisco Systems Internet Engineering Task Force, working paper), available at <http://www.ietf.org/proceedings/04mar/1-D/draft-ietf-sipping-location-requirements-00.txt>; J. Polk et al., Dynamic Host Configuration Protocol Option for Coordinate-based Location Configuration Information, (Dec. 2003) (Cisco Systems Network Working Group, working paper), available at <http://www.ietf.org/rfc/rfc3825.txt>; Henning Schulzrinne, Dynamic Host Configuration Protocol (DHCPv4 and DHCPv6) Option for Civic Addresses, (July 2004) (GEOPRIV, working paper), available at <http://www.ietf.org/internet-drafts/draft-ietf-geopriv-dhcp-civil-07.txt>.

agent capabilities and profiles, both of which help to provide a fully functioning emergency system.¹⁴⁰ An important emergency service capability is caller authentication, and the SIP specification documents authentication techniques, as do a number of draft documents.¹⁴¹ Finally, it is worth noting that the provision of VoIP emergency services needs to account for interfacing between the PSTN and VoIP networks. As indicated in greater detail below, early implementations of VoIP emergency services have been designed largely within the context of interfaced VoIP and PSTN networks, with PSAPs and emergency service responders on the PSTN side.¹⁴²

A phased approach could be employed to replicate emergency services functionality in the SIP VoIP environment, as described by Henning Schulzrinne and Knarig Arabshian.¹⁴³ In the simplest, and typically initial, case, the SIP elements could connect to the legacy E911 system through a PSTN gateway. In this case, the SIP device would look much like other devices commonly attached to the PSTN (e.g., a private branch exchange ("PBX")). This scenario requires development of little new technology, though a number of existing mechanisms would need to be considered, such as security, availability, and routing.¹⁴⁴ Nonetheless, a certification process could be useful in terms of ensuring the accuracy of location information.¹⁴⁵ Also, a labeling procedure could indicate any additional information that consumers might need. In a second case, the PSAP would be directly connected to, or "aware" of, IP network traffic. In other words, a gateway would not translate INVITE¹⁴⁶ messages into PSTN signaling messages; therefore, the SIP session would occur between the

140. See D. Petrie, A Framework for Session Initiation Protocol User Agent Profile Delivery (May 2004) (unpublished paper), available at <http://www.softarmor.com/wgdb/docs/draft-ietf-sipping-config-framework-03.txt>.

141. A user authentication capability should help prevent such problems as crank calls. However, a failed authorization could result from an administrative or technical problem. Accordingly, a response mechanism and an authentication policy need to be established.

142. See, e.g., White Paper, Avaya Inc., Solving the Challenges of E911 Service with Avaya IP Telephony Networks (Nov. 2002), <http://www1.avaya.com/enterprise/whitepapers/lb1879.pdf>.

143. Henning Schulzrinne & Knarig Arabshian, PROVIDING EMERGENCY SERVICES IN INTERNET TELEPHONY (Mar. 2004), <http://www.cs.columbia.edu/~knarig/911.pdf>.

144. Many security and routing technologies already exist. For example, the process of authentication and authorization could be based on existing mechanisms or SIP techniques and later could possibly be based on trait-based mechanisms currently under development. *Id.* § 3.4.

145. As Schulzrinne describes, location information may need to be manually configured, measured by the end system (GPS), conveyed to the end system, or provided within the network. *Id.* § 3.3.

146. An INVITE message is used in SIP to serve as the mechanism for requesting a session (i.e., a call) with another user. *Id.* § 3.4.

caller and the emergency call center. As a result, the caller and the emergency call center would be able to exchange additional information, such as the patient's video or healthcare data. In this case, the routing, identification, and location information would probably still reside in telephone company databases; however, the responder could now communicate with the caller using a richer media capability, as a result of direct connectivity over IP, which is able to support multimedia communications. In a third long-term case, the routing, identification, and location information would now reside within the Internet, and the INVITE message would carry the traffic to the PSAP. The elements within the SIP network could gather the appropriate routing and location information using a number of mechanisms (e.g., the use of DNS in mapping locations to PSAPs and emergency call centers). While the details of such a process are outside the scope of this Article, these details may nonetheless prove extremely relevant to the certification mechanisms that could be deployed.

As the preceding paragraphs suggest, VoIP emergency services could be developed by making enhancements to existing SIP-based networks. The point is that these capabilities either currently exist or will soon exist. The challenge now involves the actual implementation of these capabilities, which is where a certification process can help.

E. Technology Requirements

To assist in defining the characteristics of this process, this Subpart will next examine high-level requirements for VoIP emergency services. It proposes that the certification process should first support a phased implementation. While interim solutions are available immediately, some aspects of the longer-term solution will require additional technical development, further industry negotiations with possible regulatory intervention, and considerable investment. Therefore, as Schulzrinne describes, a short-term solution—attaching IP devices to the PSTN emergency services in much the same way as the devices are attached to a PBX—should be available for certification now. A longer-term solution—where IP interfaces with the PSAP directly, the PSAP participates in the IP session, and the databases are IP accessible—should also be specified as soon as possible.

With this phased approach, this Article proposes that the technology specifications should support a range of technologies. For example, a certification process should be developed for other IP services, such as instant messaging or videophone. Further, various levels of specification should be available within a technology. For example, several levels of VoIP certification might be made available (e.g., good, better, and best).

The Subpart below proposes a so-called straw man,—a provisional,

exploratory sketch—of the high-level specifications that might be required of a high-quality VoIP service, a “best” service level. Note that this service could be running as software, an IP phone, or another device.¹⁴⁷ Also note that this Article focuses on certifying and labeling the VoIP-end device rather than the network.

This straw man framework’s general capability would provide information to end users through such means as device labeling or software notification. It would also provide reasonable quality of service (i.e., meeting the performance and reliability measures previously discussed). System capability would access the emergency services infrastructure and form proper emergency services messages. It also would accurately determine and communicate the proper location of VoIP applications and callers. Finally, the end user capability would participate in an authentication process, initiate emergency services calls using a recognized emergency number (e.g., 911 or SOS), and test the emergency services applications.

The details of how these requirements might be assessed remain to be determined. Furthermore, other requirements also warrant consideration and perhaps some of the requirements listed above merit debate. Accordingly, comments and feedback are welcome.

IV. TRENDS IN CERTIFICATION AND CONSUMER PROTECTION: A BRIEF VIEW OF THE EUROPEAN AND AMERICAN APPROACHES

This Article briefly outlined Europe’s and the United States’ historically different approaches to standardization and certification and asserted that many U.S. approaches have been borrowed from the European tradition. This Article has also contended that the United States and Europe are slowly harmonizing their approaches through the TCBs. How might such a collaborative concept also apply to VoIP? One way is to consider the best mechanism, European or American, for resolving the liability issues that may arise from VoIP product certification. The United States offers a consumer-action-based system of legal redress that contrasts sharply with the preventative measures taken in the European state-based social system of protections. In the United States, citizens can take legal action and seek punitive damages for relief if products do not perform as advertised or if products are defectively designed, manufactured, or labeled. In Europe, however, the state tends to take a more active role *ex ante* (i.e., before products are launched into the marketplace). The European approach, then, is to rely on state-sponsored certification, to

147. While other network requirements exist, these requirements are beyond the scope of this Article.

provide protections to companies that obtain such certification, and to make consumer remedies available only as a last recourse.

Europeans tend to be more precautionary *ex ante* than Americans, and they tend to turn to the state and to organizations like ETSI to help set safety guidelines. In the case of VoIP technology, however, it is almost too late for European and American regulators to implement preventative measures of any kind. Any action, by definition, will be reactive. However, in other areas of technology, such as wireless telephony, Europeans—and to some extent Americans—have not hesitated to impose an oxymoronic *ex post* precautionary principle, which will be discussed later in this section, to an existing network of wireless telephones.¹⁴⁸ Such an *ex post* approach, if applied to VoIP, will likely be unsuccessful, but it may prove instructive to review some of the differences between European and U.S. approaches in general. As scholar Adam Burgess explains, “Since the 1980s, Europe has increasingly established an identity around concern about vaguely conceived threats to the health of its citizens. Unlike uncaring, free market America, in this scenario, ‘social’ Europe is aware of the threat posed by the dangerous products of ‘unscrupulous’ multinationals.”¹⁴⁹

It is perhaps helpful to understand that Adam Burgess is a sociologist who recently published a book that tracks the sociological phenomenon of the public’s fear of phones based on the “hysteria factor,” discussed below.¹⁵⁰ In the instance cited above, Burgess purposely oversimplifies the

148. Fears arising from mobile phones triggered protests in Italy that called for the closure of the Vatican’s broadcast facilities, led to the freezing of wireless deployment in Spain for nearly a year, and caused serious 3G deployment problems in Germany and elsewhere. As a result, many called for the *ex post* application of the precautionary principle to broadcast emissions. In Italy, the Vatican even turned down the emissions due to hysteria. See Yaroslov Trofimov, *Italians Say Potent Vatican Tower Emits Radiation That Poses Cancer Risk*, WALL ST. J., Mar. 27, 2001, at B7A. Several failed U.S. cases also attempted to attach cancer liability to mobile phone manufacturers. See, e.g., *Motorola v. Ward*, 478 S.E.2d 465 (Ga. Ct. App. 1996) (rejecting a claim against a cell phone manufacturer for causing or exacerbating cancer due to lack of causation and inconclusive evidence); *Reynard v. NEC Corp.*, 887 F. Supp. 1500 (M.D. Fla. 1995) (rejecting a plaintiff’s wrongful-death action for lack of causation and for failure of the *Daubert* test); *Newman v. Motorola*, 218 F. Supp.2d 769 (D. Md. 2002) (rejecting a cancer claim against a cell-phone manufacturer for failure of the *Daubert* test); *Chernock v. U.S.*, 718 F. Supp. 900 (N.D. Fla. 1989) (ruling against several workers’ claims against the government for injuries allegedly caused by operating radar devices); *Wireless Telephone Radio Frequency Emissions Products Liability*, 248 F. Supp. 2d 452 (D. Md. 2003) (preventing claims brought by five classes of phone purchasers who were not provided with headsets for use in guarding against possible danger because federal law sets safety standards and preempts such claims).

149. Adam Burgess, *A Precautionary Tale: The British Response to Cell Phone EMF*, 21 IEEE TECH. & SOC’Y MAG., Dec. 2002, at 14, 15.

150. See generally ADAM BURGESS, *CELLULAR PHONES, PUBLIC FEARS, AND A CULTURE OF PRECAUTION* (2003) (seeking to explain how these fears came about in the first place—in both Europe and the United States—and uses a sociological lens to critique today’s

problem: America is not “uncaring,” and Europe’s “aware[ness] of the threat” does not necessarily exceed that of America. What Burgess is doing, then, is making an insightful cultural point: where the United States tends to take an ad hoc, laissez-faire approach to consumer harms, Europe traditionally takes a more precautionary stance. These markedly different *modi operandi* and their impact on certification processes cannot be overlooked.

A. *Different Approaches to Product Liability*

Interestingly enough, the American and European approaches to liability have not always been so different, particularly since the United States once borrowed many of its laws from Europe. Indeed, every first-year American law student is familiar with a famous judgment that has had widespread implications on U.S. liability cases. In 1934, Justice Benjamin Cardozo first articulated and then dismissed the following legal principle, and he did so in the same judgment: stop, look, and reconnoiter. Cardozo had to first articulate the principle and then dismiss it because, in the tradition of common law, the higher courts have to be clear on the precedent before reaching a different conclusion. In plain English, this precept was originally derived from advice about stopping a car before crossing railroad tracks. However, the “reconnoiter” aspect is somewhat more complicated, for it seemingly stipulates that a driver should stop the car, get out, inspect the area and look for trains, get back in the car, and, assuming no trains are approaching, cross the tracks. In this instance, Justice Cardozo noted that reconnoitering is unnecessary and quite possibly dangerous.¹⁵¹ In passing this judgment, however, Cardozo reversed an earlier decision by Justice Oliver Wendell Holmes, who had decreed that an individual was obliged to get out of the vehicle and reconnoiter before crossing the tracks.¹⁵² Not unexpectedly, Cardozo’s reinterpretation of the “stop, look, and reconnoiter” provision and the greater application of that provision in the legal world have had a profound effect on the number of civil cases involving punitive damages that have been tried in the United States during the past seventy years. When Cardozo declared that

precautionary climate).

151. *Pokora v. Wabash R.R. Co.*, 292 U.S. 98, 104 (1934). Justice Cardozo explained: Standards of prudent conduct are declared at times by courts, but they are taken over from the facts of life. To get out of a vehicle and reconnoiter is an uncommon precaution, as everyday experience informs us. Besides being uncommon, it is very likely to be futile, and sometimes even dangerous. If the driver leaves his vehicle when he nears a cut or curve, he will learn nothing by getting out about the perils that lurk beyond. By the time he regains his seat and sets his car in motion, the hidden train may be upon him.

152. *Baltimore & Ohio R.R. v. Goodman*, 275 U.S. 66 (1927).

individuals no longer need to reconnoiter before crossing railroad tracks, he initiated a trend that eventually placed a greater burden on railroad companies, and, in turn, on manufacturers in general. In short, the state would no longer expect individuals to take commonsense precautions to protect themselves from harm; instead, large companies would be held increasingly responsible for any damages caused by their products.

Here, let us take a step back and look at the philosophical and linguistic underpinnings of expressions of precaution. The phrase “stop, look, and reconnoiter” is composed of an unusual mixture of English (stop, look) and French (reconnoiter, a derivative of the French word *reconnaître*).¹⁵³ Indeed, virtually all American law students have to stop, look, and reconnoiter—that is, find a dictionary—when they read the famous case, because the word reconnoiter is not commonly used in the English language. The U.S. approach to consumer protection has changed drastically in recent decades, as encapsulated by the multibillion-dollar sums that tobacco plaintiffs have taken home.¹⁵⁴ Certainly, many of the people who have been diagnosed with or who have died from cancer as a result of smoking cigarettes did reconnoiter the damage that tobacco causes to their lungs, and yet many of these individuals and their families have sought punitive damages and have been compensated accordingly for pain, suffering, and wrongful death by the cigarette manufacturers. As it turns out, the leading U.S. cases for punitive damages have all arisen since the 1980s—and many have since been quashed by the Supreme Court.¹⁵⁵ So, returning to Adam Burgess’s quote above, even if Burgess has oversimplified the American and European outlooks on consumer protections, he is right to say that the divergence between the two world views was set in motion at some point in the past century, possibly even in 1934 with Cardozo’s ruling.

Thus, Americans arguably are no longer expected to reconnoiter; instead, large firms and multinational corporations are seemingly expected to shoulder the majority of consumer risk, and their perceived accountability for product defects and failures often translates into

153. The French word *reconnaître* and its English form, reconnoiter, means to *faire une reconnaissance* or, in English, to survey and review. THE HARPER COLLINS FRENCH CONCISE DICTIONARY 752 (1998).

154. See generally Elisabeth J. Calabrese, *Unfinished Business: Reaching the Due Process Limits of Punitive Damages in Tobacco Litigation Through Unitary Classwide Adjudication*, 36 WAKE FOREST L. REV. 979 (2001) (surveying and discussing the tobacco claims and the multibillion-dollar settlements and awards).

155. See generally Patrick S. Ryan, *Revisiting the United States Application of Punitive Damages: Separating Myth from Reality*, 10 ILSA J. OF INT’L & COMP. L. 69 (2003), available at <http://ssrn.com/abstract=545243> (describing the development of punitive damages as a tort remedy in the United States through recent U.S. Supreme Court cases).

multimillion-dollar, or even multibillion-dollar, settlements. Nonetheless, the essence of the “stop, look, and reconnoiter” precaution lives on in both American and European culture in commonplace adages, such as “an ounce of prevention is worth a pound of cure,” “better safe than sorry,” and “look before you leap.” These expressions have Dutch,¹⁵⁶ French,¹⁵⁷ and German equivalents,¹⁵⁸ as well as equivalents in other languages. The Hippocratic Oath, which arose out of Greece more than 2,000 years ago, has governed the actions of physicians for centuries,¹⁵⁹ and it offers yet another interpretation of what will become known as the “precautionary principle.” According to the oath, each physician is instructed to “prescribe [a] regimen for the good of my patients according to my ability and my judgment and never do harm to anyone.”¹⁶⁰ While the United States has in large part replaced the stop, look, and reconnoiter provision with a legal mechanism for instituting punitive damages, at one point the U.S. system much more clearly resembled the European system. In tying this discussion back to the topic of VoIP telephony, however, we can see that neither Europe nor the United States has properly prepared for the new challenges that will arise from the proliferation of VoIP or for the difficulties involved in developing standards to address emergency services.

156. The following common Dutch phrases are translated more or less directly: “beter voorkomen dan genezen” (it is better to prevent than to cure), “bezint eer ge begint” (reflect before you begin), “beter te hard geblazen dan de mond gebrand” (it is better to have blown too hard than to have burned your mouth), and “een gewaarschuwd man is er twee waard” (one warned person is worth two people).

157. The most common term in French is “il vaut mieux prévenir que guérir” (it is better to prevent than to heal). Such was the title of a recent article in Switzerland asserting that the precautionary principle should be applied to “electrosmog” and to radio emissions in general. Jürg Baumann says that electrosmog is omnipresent in our environment and suggests that the precautionary principle should be applied in a proposed law that would greatly regulate and reduce the installation of new sites. Jürg Baumann, *Smog Électrique: Mieux Vaut Prévenir que Guérir*, 2 ENVIRONNEMENT 1999, available at http://www.umwelt-schweiz.ch/buwal/fr/medien/umwelt/1999_2/unterseite4/ (last visited Nov. 16, 2005).

158. The following common German phrases are translated more or less directly: “vorsicht ist die mutter der porzellankeise” (care is the mother of the box of chinaware), “vorbeugen ist besser als heilen” (prevention is better than cure), “man muss das uebel bei der wurzel packen” (grab evil by its roots), and “wehret den anfaengen” (resist the beginnings of something bad). The latter two phrases, outgrowths of Nazi Germany, are often referred to in a political context. For a list of German aphorisms, see www.aphorismen.de (last visited Nov. 16, 2005).

159. “The Hippocratic Oath is thought to have originated some 2,300 years ago on the Greek Island of Cos. It remains today the ‘central document, the most often-cited summary of the physician’s own understanding of what is morally required to be a good medical doctor.’” David L. Katz, *Perry v. Louisiana: Medical Ethics on Death Row—Is Judicial Intervention Warranted?*, 4 GEO. J. LEGAL ETHICS 707, 714 (1991) (citations omitted).

160. AAPS Physician Oaths, <http://www.aapsonline.org/ethics/oaths.htm> (last visited Nov. 16, 2005).

B. Technological Development Will Forge Ahead in the Face of (Pre)caution

Internet telephony will continue to develop, and the absence of an industry coalition to certify and standardize products will leave an abundance of different standards and concomitant safety problems. In fact, the market drivers for VoIP adoption are overwhelming. For example, Internet telephony will enable foreigners who live in the United States to communicate with their loved ones in their home countries at virtually no cost. Furthermore, products like KaZaA's Skype,¹⁶¹ an application-layer terminal, are only in their infancy, and, regardless of what happens with the regulation of E911, these products will continue to develop and appear on the marketplace. Accordingly, the time is now to develop a certification process that affords carriers a level of protection that they can rely on.

As can be observed in the status quo, inconsistent implementation of protective measures in different U.S. states seems to have inspired certain carriers to adopt subversive approaches to network deployment. For example, in spite of political maneuvers undertaken to facilitate network construction,¹⁶² vocal community protest induced companies like Omnipoint to try to build several hundred stealth-antenna sites without municipal authorization during the 1990s.¹⁶³ In this particular case, Omnipoint may have concluded that the time and expense required to obtain authorization for the antennas, along with the ensuing public outcry,

161. See Skype Home Page, <http://www.skype.com/> (last visited Nov. 16, 2005).

162. See H.R. REP. NO. 104-204, at 95 (1995), reprinted in 1996 U.S.C.C.A.N. 10, 61-62. The Report reveals Congress's intent to achieve national uniformity over radio frequency emissions standards and notes the interplay between these standards and local zoning laws:

The [Commerce] Committee has received substantial evidence that local zoning decisions, while responsive to local concern about the potential effects of radio frequency emission levels, are at times not supported by scientific and medical evidence. A high quality national wireless telecommunications network cannot exist if each of its component [sic] must meet different RF [radio frequency] standards in each community. The Committee believes the [FCC] rulemaking on this issue (ET Docket 93-62) should contain adequate, appropriate and necessary levels of protection to the public, and needs to be completed expeditiously.

Id.

163. See John Cichowski, *Antenna Critics Demand Answers*, RECORD, Sept. 4, 1997, at L3. Cichowski discusses Omnipoint's arrangement with the state of New Jersey to put up 122 sites without municipal approval. Because of political pressure, the New Jersey Governor stepped in to provide the municipalities with a veto right. The article also discusses Omnipoint's stealth erection of these sites in a commercial zone without first obtaining zoning approval. *Id.* Leslie Haggin discusses an Omnipoint cellular phone antenna that was erected on the side of the Newark Pompton Turnpike without any zoning approval. Municipal authorities forced the antenna to be taken down. Leslie Haggin, *Complaints Force Down Cell Phone Antenna*, RECORD, May 9, 1997.

would have prevented it from competing successfully with existing providers who had erected antenna sites years prior. Such stealth deployment of wireless sites is not unlike the phenomenon that we are now experiencing with respect to new companies, like Skype, that are selling application-level software for people to run on their PCs. Before we know it, everyone's computer will be outfitted with not one but several mechanisms that enable voice communications. In the end, an industry-coordinated effort to certify these types of products may help to make the stealth and lesser-known solutions less attractive to consumers.

C. Government Must Respond by Encouraging Self-Regulation

More and more VoIP products are deployed each day, and the certification and associated liability issues will inevitably have to be addressed. A concerted effort of various parties (e.g., academics, consumers, governments, and nongovernmental organizations) will be required to ensure that the growth and deployment of VoIP occur in a sensible way that protects consumers by allowing them access to emergency services. Moreover, even though the effort will need to be coordinated by these various stakeholders, industry must leap to the forefront of this initiative. Along these lines, the government will have to abandon its attempts to control development—particularly in cases where development cannot be controlled—and encourage industry to collaborate in a self-regulatory effort.

As already seen, the government has relaxed antitrust regulation to allow industry consortia to conduct joint research and development through the NCRA. This trend must continue. In the words of science writer Robert Pool:

[f]or better or worse, technology has changed. Our days of innocence, when machines were solely a product of larger-than-life inventors and hardworking engineers, are gone. Increasingly, technology will be a joint effort, with its design shaped not only by engineers and executives but also psychologists, political scientists, management theorists, risk specialists, regulators and courts, and the general public. It will not be a neat system. It is probably not the best system. But, given the power and complexity of modern technology, it is likely our only choice.¹⁶⁴

Pool encourages us to embrace the future development of technologies and to increase our awareness of the roles and impact of these technologies. As he notes, the “power and complexity of modern technology” warrant implementation of a proactive, multidisciplinary, cooperative approach that addresses the challenges of our increasingly

164. Robert Pool, *Beyond Engineering: How Society Shapes Technology* 305 (1997).

technological world.

Of course, the idea that Robert Pool's "joint [product development] effort" is really our only choice might be challenged by some skeptics. However, the concept is a useful construct for the fast-changing technology sector, particularly in areas, like VoIP, where government regulation has proven that it has difficulty in keeping up with progress.

D. An Ounce of Precaution is Better Than a Pound of Precaution, Particularly When the Opportunity is Lost

As previously seen, the development of emergency services and wireless technologies can be analogized to the development of VoIP. Europeans, for example, have attempted to apply the precautionary principle in wireless deployments. Accordingly, for our purposes it might be useful to briefly explore the possible application of this principle in E911 and VoIP deployments and then dismiss that same possibility—much like Justice Cardozo did when he ruled that individuals may need to stop and look but that they do not need to reconnoiter.

The precautionary principle is a powerful, but extreme, example of governments' constant struggle between encouraging the development of new and exciting technologies and exerting control over those technologies so as to protect the citizenry. In attempting to define the precautionary principle and bring form to its manifold vague shapes, many scholars have traced the roots of the principle to German law, the *Vorsorgeprinzip*,¹⁶⁵ particularly in connection with environmental policy.¹⁶⁶ The

165. *Vorsorgeprinzip*, translated literally, means "foresight principle" or "forecaring principle." A typically vague clarification of what the precautionary principle means can be found in an article written by Nicola Notaro, *Environmental Policy*, in *GUIDE TO EU POLICIES* 226 (Gabriel Glöckner et al. eds., 1998). The author notes that the precautionary principle is part of European law and draws a connection between the principle and the *Vorsorgeprinzip*, though he stops short of any meaningful discussion of its meaning. According to Notaro, the precautionary principle was:

[a]dded by the TEU [Treaty of the European Union] and stems from German environmental law where it is known as the *Vorsorgeprinzip*. The principle is that whenever there is a strong suspicion that a certain activity may have environmentally harmful consequences, it is better to act before the damage occurs rather than wait for incontrovertible scientific evidence.

Id. at 229.

166. See Katherine Barrett & Joel Tickner, *Trans-Atlantic Consumer Dialogue (TACD) Briefing Paper on the Precautionary Principle*, (Apr. 23, 2001) (Working Paper, on file with the University of Massachusetts Lowell Center for Sustainable Production). The authors discuss the origins of the *Vorsorgeprinzip*, associating it with the modern precautionary principle and attributing its origins to a West German movement during the early 1970s. The authors emphasize, however, that the meaning of the term has changed since the 1970s: "It is critical to note that the Germans viewed *Vorsorge* as a *means of stimulating innovation and social planning for sustainability*, rather than simply a tool to block potentially

Vorsorgeprinzip origins of the precautionary principle are based on the rationale that, as Konrad von Moltke notes, "Environmental policy is not fully accomplished by warding off imminent hazards and the elimination of damage which has occurred. Precautionary environmental policy requires furthermore that natural resources are protected and demands on them are made with care."¹⁶⁷ The precautionary principle finds its natural home in environmental law,¹⁶⁸ but its exact meaning and the manner in which it should be applied elsewhere, such as to various aspects of telephony regulation, are subjects of great debate and controversy.¹⁶⁹

Scholars have invested great time and energy in investigating the origins of the precautionary principle and its application to science.¹⁷⁰ While it is correct to credit Germany with the principle's metamorphosis into a legal norm, it is perhaps more useful to recognize the principle's more general derivation. Simply put, the precautionary principle is at best just a principle. Thus, the principle is *not* law, even if it is mentioned in the Treaty for the European Union and other international laws in the United States, Germany, and elsewhere.¹⁷¹ Kenneth Foster, for one, has examined the precautionary principle as it specifically applies, or could apply, to mobile phones. Foster, an international expert on the effects of wireless signals on human safety, has reached the following conclusions:

The PP [Precautionary Principle] is not a scientific proposition, nor is it a precisely defined proposition in international law; there is some question whether it even qualifies as being a "principle" at all. Rather, *it is a counsel for risk aversion*, expressed in varying ways in numerous treaties and other documents. In practice, its application is constrained by policies, statutes and case law of individual states and international law.¹⁷²

dangerous activities." *Id.* (emphasis in original) (citation omitted).

167. Konrad von Moltke, *The Vorsorgeprinzip in West German Environmental Policy*, in TWELFTH REPORT: BEST PRACTICAL ENVIRONMENTAL OPTION app. 3, at 58 (Royal Commission on Environmental Pollution, 1988) (quoting the West German government).

168. See generally Notaro, *supra* note 165 (discussing the precautionary principle in the context of European environmental policy).

169. See, e.g., Cass Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003, 1003 (2003) ("[T]he precautionary principle should be rejected, not because it leads in bad directions, but because it leads in no direction at all. The principle is literally paralyzing—forbidding inaction, stringent regulation, and everything in between.").

170. *Id.* at 1005 (noting the German origins of the precautionary principle).

171. See, e.g., Montreal Protocol on Substances That Deplete the Ozone Layer, Sept. 16, 1987, 26 I.L.M. 1550, 1551 (applying the precautionary principle by treaty to the ozone layer); Conference on Environment and Development, March 2–April 3, 1992, *Protection of Oceans*, 32, U.N. Doc. A/CONF.151/PC/100/Add.21 (Dec. 17, 1991) (applying the precautionary principle by international treaty to the coast); Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Jan. 29, 2000, 29 I.L.M. 1027, 1027 (applying the precautionary principle generally to living organisms).

172. Kenneth R. Foster, Professor of Bioengineering, Univeristy of Pennsylvania,

Indeed, as Foster has suggested, the precautionary principle is no more than “counsel for risk aversion,” the kind that can be found both in our legal systems and in everyday aphorisms (e.g., better safe than sorry).¹⁷³ So, while it may be helpful for lawyers to take note of the German movement that incorporated the *Vorsorgeprinzip* into environmental law in the 1970s and 1980s, it is somewhat shortsighted to draw wide-ranging conclusions from the German movement.

Thus, though we have gained a greater understanding of the origins of the precautionary principle, we are nonetheless left with the following questions: should precautions, or, more specifically, the precautionary principle, be applied to mobile phone safety? To Internet telephony? The answer to these questions, deceptively, is both *yes* and *no*. As might be expected, the general confusion as to how to apply the principle only increases when it is applied within the context of telephony and the different technologies associated with it.¹⁷⁴ Naturally, we should be cautious, even *precautious*, about products on the marketplace. However, the precautionary principle should not be applied as a matter of law, if for no other reason than the fact that it is *not* law. Accordingly, as we turn to our proposed model for regulation, we wish to emphasize that the unfortunate alternative to a self-regulatory certification process may be the largely unproductive *ex post* application of precaution through some form of the precautionary principle.

V. A PROPOSED MODEL

This Part will present a specific institutional framework and a set of summary technical criteria and procedure recommendations in order to provide a concrete model of a capability for emergency services self-regulation and certification. Other models could be developed. However, this proposed model represents the authors’ best recommendation based on current information and understanding.

A. Institutional Design

This Subpart refines the general observations of Part III into the following recommendation: Government agencies should perform some initial coordination between federal and state levels and then publicize a

Presentation at the WHO/NIEHS/EC Conference on the Precautionary Principle: Can Electromagnetic Fields Trigger the Precautionary Principle? 2 (Feb. 2003) available at http://www.seas.upenn.edu/~kfoster/precautionary_foster.PDF. (emphasis added) (citation omitted).

173. *Id.*

174. See Burgess, *supra* note 149, at 15.

consistent and credible statement of intent to regulate VoIP emergency services unless credible self-regulation emerges. At the same time, government agencies should move to facilitate successful self-regulation, as described *infra*.

1. Industry Should Organize

Industry service and equipment providers should form an organization to pursue VoIP emergency services. Such an organization could be a derivative of an existing industry trade association or consortium, and it should have the following characteristics: (1) it should be funded by and heavily involve industry participants; (2) it should remain intentionally open and transparent to all industry participants and other stakeholders, particularly regulators and consumer interest groups—such arrangements should be codified in the organization's bylaws; and (3) it should develop standards, as well as update and extend them. Traditional open standards bodies, such as IETF, the ISO, and the American National Standards Institute ("ANSI") can serve as models. Although the body would initially focus on emergency services, it could eventually embrace other social policy self-regulation goals as well.¹⁷⁵ This organization should also do the following: create a brand around the certification, establish the appropriate legal protections, act as a co-sponsor with the government to promote public awareness of the certification, maintain a database of accreditations, and police accreditations. The standardization activity would draw on the momentum built by the Voice on the Net ("VON") Coalition, an alliance between NENA¹⁷⁶ and several VoIP industry participants. The VON Coalition is described in more detail on the following pages.

2. A Separation of Powers Should be Established

While organizing industry into consortia for appropriate standards-setting efforts is a great start, an additional step is needed. In particular, the process should not be held captive to the interests of certified parties. Concretely, this Article recommends implementation of two specific "separation of power" elements in order to enhance the credibility of the process. First, multiple independent and competitive testing organizations

175. The motivation for new social policy goals could not be expected to arise naturally from the industry participants in this organization. As indicated elsewhere, an external motivation is needed. Most likely, such a motivation would come in the form of a public debate culminating in a credible threat of government intervention. The close coordination with government that this Article proposes could facilitate the efficient signaling of such events.

176. See National Emergency Number Association Home Page, http://www.nena.org/About_Contact/index.htm.

should perform accreditation. Furthermore, either these organizations or third parties should provide precertification consulting and training. Second, these testing organizations should be accredited by a third party, distinct from both the standards-setting and certification branding organization and from the testing organizations. The two major candidates for this role are a government agency and an independent institution (e.g., a respected neutral institution, such as ANSI).

3. Industry and Government Should Work Hand in Hand

In order to facilitate these ends, government agencies should appoint personnel to assist in the formation of the self-regulation process as follows: (1) credibly transmit the threat of government regulation if self-regulation fails; (2) report back to the government the level of progress made; (3) ensure agency experts provide input into certification standards and process design; (4) promote self-regulation elsewhere in government by recognizing self-regulatory efforts as mitigating factors in punitive proceedings; (5) educate users about certification—both industry and government should co-sponsor this goal; (6) work with the telecommunications industry in order to incorporate the insurance industry in the process and clarify the level of liability mitigation beyond government liability mitigation provided to those who diligently certify products; and (7) liaise with other interested government parties (e.g., Congress).

Although the preceding responsibilities will require significant effort, their implementation will require dramatically less effort than that required to create and execute government command-and-control regulation. That said, it should be clear that this Article is by no means advocating a passive government role.

B. Technical Approach

Ideally, this transition to an IP-based emergency services solution should not burden future models with legacy assumptions. The design, function, and operation of the Internet provide an abundant set of possible solutions, and policy addressing future emergency services should embrace this flexibility and optimize the potential social benefits. The policy thus (1) should not restrict the manner in which a function is provided; (2) should support multiple implementation methods; (3) should encourage the incorporation of emergency services into other technologies; and (4) should encourage developers to create cheaper, better, and more feature-rich technologies.

Certification will likely need to include both certification of terminals,

which can potentially be transported to a test site, and certification of network characteristics, which cannot. This Article focuses only on the former, mainly because it is difficult, if not impossible, to exhaustively test all network nodes and usage combinations as a part of certification. With these thoughts in mind, network testing should use a meta-standard style process certification focused on (1) the way in which the network is designed and managed to maintain an emergency services capability; and (2) random performance testing of particular nodes and situations.

The diversity of possible VoIP systems will most likely preclude the possibility of certification to a single level of performance. This diversity should be encouraged. Consequently, this Article proposes that different levels of capability be certified, keeping in mind that the number of levels needs to be small enough that consumers can distinguish them. VoIP systems might, for example, have two certification levels: a carrier grade level with significant requirements and a noncarrier grade level with less strenuous requirements.

As part of the proposed implementation plan, this Article recommends the use of the stages suggested in the NENA/VON Coalition initial agreement on VoIP emergency services.¹⁷⁷ These stages, or phases, are as follows:

Phase One Certification based on the NENA/VON Coalition interim solution would include (1) delivering a 911 call through the existing 911 network; (2) providing a callback number to PSAP; and (3) providing initial location information to PSAP (optional).¹⁷⁸

Phase Two Certification based on the NENA/VON Coalition long-term solution would include (1) delivering a 911 call through an IP network to an IP-connected PSAP or through an existing 911 network if PSAP is not IP-connected; (2) providing a callback number or recontact information to PSAP; and (3) providing caller location information to PSAP.¹⁷⁹ This phased approach enables near-immediate implementation of emergency services. It also encourages a move away from traditional emergency services toward a more competitive environment.

C. Labeling

This Article has noted throughout that labeling could be an important aspect of the certification process. While the details of such a mechanism warrant a separate analysis, this Subpart briefly proposes a labeling

177. See VON Coalition Initial Agreement, Dec. 2003, available at http://www.nena9-1-1.org/VoIP_IP/VOIP-NENA%20Actual%20Agreement.pdf.

178. *Id.*

179. *Id.*

initiative, discusses its merits, and provides suggestions regarding the manner in which it might be used.

Labeling may include such concrete and diverse elements as (1) an identifiable sticker attached to IP phones showing the name of the certifying organization and the address of a website that provides certification details and updates; (2) a software window that periodically reminds users of emergency services specifications, possibly when the device or software detects some configuration change; and/or (3) an e-mail sent to the user when the network detects a change in its configuration.

By tying the operation of the label to system changes, the label becomes a dynamic mechanism that could become very useful in situations when the network and the device cannot automate the proper operation of the emergency services system (i.e., when a user might need to intervene). Lastly, considering the litigious nature of our society, labeling likely provides some legal protection to the VoIP service or software provider. In other words, labeling could be used to provide users with information about the (1) availability or lack of emergency services support; (2) emergency services limitations; (3) configuration requirements; (4) configuration changes; and (5) alternative methods of summoning help.

VI. CONCLUSION

While the telecommunications industry has proven adept at self-regulating in areas of interoperability, social policy regulation has historically been the purview of the government. The diversity engendered through the transition to VoIP will challenge such command-and-control regulatory policies, and we believe the time has come to consider the alternative of social policy self-regulation. There are key challenges that arise from a self-regulatory process, but the framework provided in this Article offers a solution. Success in this area would not only provide substantial value in the case of VoIP emergency services, but it would also add a vital new regulatory approach for use within the telecommunications industry, which continues to evolve rapidly.

VoIP technology enables a much broader range of technical and business approaches than were feasible in the PSTN world. On the one hand, this new technical reality heralds a new era of innovation and flexibility for users, while on the other hand it makes difficult—or, more likely, impossible—the task of mapping traditional social policy goals and constructs from the PSTN world to the VoIP world in a straightforward manner. Many current social policy goals should be preserved in one form or another and new policy goals should be considered over time. With these thoughts in mind, it seems we would be well-served by a more flexible, rapid, and innovative method of mapping such goals onto the increasingly

heterogeneous world of telecommunications.

Emergency services are a critically important and immediate case in point. Traditional emergency services expectations include connection of timely, highly intelligible emergency calls with the appropriate answering point and communication of critical information regarding the call's place of origin, both as a network address and as a physical location. The variety of VoIP implementations makes these expectations intrinsically difficult to meet. Thus, this Article proposes that the industry design—using input from the government and other stakeholders—a multi-tier certification scheme that will provide a VoIP emergency services capability that can fully satisfy these expectations. The certification regime should focus on several key technical characteristics of VoIP systems, including addressing, routing, location, security, availability, and related network and application standards.

This analysis is not complete in some important respects. From the technology perspective, a broad set of technology categories should be developed that might be based on media type, network access, user expectations, or some other criteria. Within these categories, a set of characteristics should be defined, upon which a certification process could be applied as this Article laid out above for VoIP. While this Article presents some basic legal analysis and inquiry into the role of standardization and consortia in institutional design, more research is needed in this area: for example, how social policy funding will be affected by the transition to VoIP (e.g., telecommunications industry taxation helps to fund public safety, and it will be important to determine if these obligations will be transferred to VoIP or if they will be covered in some other way). Finally, this Article briefly discussed the importance of developing different categories of VoIP implementations against which different certification standards might be developed. Further investigation could allow this approach to expand to include other types of media over IP (e.g., instant messages and video).

Finally, the proposed model needs both refinement and assessment. The Authors have evaluated the model by performing critical and documented analysis of internal integrity and credibility with respect to successful precedents and by disseminating this analysis to policy-oriented audiences for critique and debate (as has been done by submitting a preliminary version of this Article to the Telecommunications Policy Research Conference).¹⁸⁰ Moreover, the analysis from Parts II and III demonstrate the validity of the authors' approach. For the longer term, this

180. See Telecommunications Policy Research Conference Home Page, <http://www.tprc.org> (last visited Oct. 2, 2005).

analysis was derived through the use of the proposed model, as well as through the execution of specific strategies for assessing that model once it is implemented. As part of this strategy, the Authors (1) monitored elements that evolved beyond the scope of this paper's technical and business model; (2) tracked specific performance metrics of certified processes and compared that data against criteria derived from consumer expectations and social policy goals; and (3) compared voluntary adoption rates of certification against a template derived from the Authors' experience in industry-sponsored certification processes. This longer-term assessment represents an ongoing effort that can benefit greatly from reader feedback. To that end, comments are welcome.

Measuring Media Market Diversity: Concentration, Importance, and Pluralism

Brian C. Hill*

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I. INTRODUCTION

In *Prometheus Radio Project v. Federal Communications Commission*,¹ the Third Circuit reviewed the media cross-ownership limits proposed by the Federal Communications Commission (“FCC”).² The Third Circuit critically examined the FCC’s use of a “Diversity Index” to reach its proposed rules³ and then remanded the Cross-Media Limits to the FCC for justification or modification.⁴ Given this somewhat unusual decision—a court not deferring to an administrative agency on a technical rule-making issue—there has been surprisingly little reaction from the academic community.⁵

This Article begins with a discussion of *Prometheus*, ultimately concluding that the FCC’s Diversity Index scheme is fatally flawed because it cannot simultaneously satisfy two assumptions shared by the FCC and the Third Circuit: (1) diversity in a media market decreases with ownership concentration; and (2) the contribution to diversity of an individual entity—“diversity importance”⁶—increases with the weighted market shares of that entity’s outlets. In Part II, this Article considers two alternatives to the Diversity Index: one designed by Professor Eli Noam to emphasize pluralism—the number of voices in media markets—and one original index specifically designed to simultaneously satisfy the two assumptions shared by the FCC and the Third Circuit. In Part III, this Article tests these alternative indices by applying them to one of the FCC’s

1. 373 F.3d 372 (3d Cir. 2004), *cert. denied*, 125 S. Ct. 2904 (2005).

2. *See id.* at 402–12; 2002 Biennial Regulatory Review—Review of the Commission’s Broadcast Ownership Rules and Other Rules Adopted Pursuant to Section 202 of the Telecommunications Act of 1996, *Report and Order and Notice of Proposed Rulemaking*, 18 F.C.C.R. 13,620 (2003) [hereinafter *Order*].

3. *See* 373 F.3d at 403–12.

4. *Id.* at 403.

5. Compare Byron L. Dorgan, *The FCC and Media Ownership: The Loss of the Public Interest Standard*, 19 NOTRE DAME J.L. ETHICS & PUB. POL’Y 443, 452–54 (2005) (criticizing the Diversity Index and commenting on the Third Circuit’s remand of the Cross-Media Limits in *Prometheus*), with John F. Sturm, *Time for Change on Media Cross-Ownership Regulation*, 57 FED. COMM. L.J. 201, 205–06 (2004) (criticizing the Third Circuit’s decision to remand the Cross-Media Limits). *See also* Ellen P. Goodman, *Media Policy Out of the Box: Content Abundance, Attention Scarcity, and the Failures of Digital Markets*, 19 BERKELEY TECH. L.J. 1389, 1411–13 (2004).

6. *See Order*, *supra* note 2, para. 396 (discussing diversity importance).

sample markets: Altoona, Pennsylvania. Part III concludes with the observation that the index proposed in this Article not only satisfies the two assumptions shared by the FCC and the Third Circuit, but also places greater practical weight on pluralism than Professor Noam's index. Finally, the Article concludes with the suggestion that adopting a suitable formulaic measure of media diversity could be the first step in a broader review of governmental regulation of media markets.

II. ANALYZING *PROMETHEUS*

In *Prometheus*, the Third Circuit found that the FCC employed "several irrational assumptions and inconsistencies" when deriving the Cross-Media Limits.⁷ In particular, the court found that the FCC had "inconsistently derived the Cross-Media Limits from its Diversity Index results."⁸ This Part begins with a review of how the FCC defined the Diversity Index, applied it to various consolidation scenarios, and then used the results to determine its Cross-Media Limits. Subpart B then reviews the Third Circuit's analysis of these procedures and its grounds for holding that the FCC had inconsistently derived the Cross-Media Limits. Finally, Subpart C explains how the Third Circuit had in fact understated the problem, showing that the Diversity Index is fatally flawed because it cannot simultaneously satisfy all of the critical assumptions shared by the FCC and the Third Circuit.

A. *The FCC Procedure for Deriving Cross-Media Limits*

This Subpart reviews the three-step procedure the FCC used to derive its Cross-Media Limits. The first section describes the FCC's Diversity Index and how the FCC applied the Diversity Index to media markets. The second section explains how the FCC used the Diversity Index to evaluate various hypothetical consolidation scenarios in media markets. The final section then describes the Cross-Media Limits that the FCC derived from its analysis of these consolidation scenarios.

1. The Diversity Index

The FCC designed the Diversity Index to identify "at risk" media markets and based it on the Herfindahl-Hirschmann Index ("HHI"), which the Department of Justice and the Federal Trade Commission use to measure the concentration effects of proposed mergers in local markets.⁹ An HHI score is calculated by summing the squares of the market shares of

7. 373 F.3d at 402.

8. *Id.* at 403.

9. *See id.* (quoting *Order*, *supra* note 2, para. 394).

the competitors in a market. "At its core," the Diversity Index used the same formula.¹⁰

The FCC first selected which types of media outlets to include in calculating the Diversity Index by looking at "consumers' reported preferences for sources of local news and information."¹¹ It then assigned a relative weight to each type of media outlet based on the popularity of that source.¹² Using this procedure, the FCC assigned a weight of 33.8% to broadcast television, 20.2% to daily newspapers, 8.6% to weekly newspapers, 24.9% to radio, 2.3% to cable Internet, and 10.2% to other Internet sources.¹³

To apply the Diversity Index to a specific market, the FCC counted the number of outlets in the market within each included media type and assigned each outlet within the same type an equal market share.¹⁴ So, for example, each of the twenty-three television stations in the New York City

10. *Id.* See also *infra* Table 1 (providing the Diversity Index formula and sample calculations).

11. 373 F.3d at 403. Local news is the FCC's "recognized indicator of viewpoint diversity in local markets." *Id.* at 405 (citing *Order, supra* note 2, para. 394, which states, "News and public affairs programming is the clearest example of programming that can provide viewpoint diversity . . . [and] the appropriate geographic market for viewpoint diversity is local . . ."). Of course, one could wonder whether the FCC's focus on local news contributes to an artificial sense of an ongoing crisis in viewpoint diversity insofar as other sources of information and perspectives are becoming substitutes for local news. However, such considerations are beyond the scope of this Article. Nonetheless, providing an adequate formula for measuring viewpoint diversity could be the first step in a broader reconsideration of the FCC's regulation of media diversity. See *infra* Part V.

12. See 373 F.3d at 403 (citing *Order, supra* note 2, paras. 412, 415, 417).

13. *Id.* Notably absent from this list is cable television. However, the Third Circuit held that the FCC properly excluded cable television "because of serious doubts as to the extent that cable provided independent local news . . .," meaning news not also provided by local broadcast television. *Id.* at 405. But the Third Circuit then held that the same considerations should have led to the exclusion of Internet sources from the list on the ground that most of the local news on the Internet is also duplicative. See *id.* at 405-07. The court also reasoned that even though the Internet provides a "universe of information" through the Web sites of individuals and organizations, those Web sites typically fall short of being actual media outlets because they fail to provide the same aggregation and distillation functions as the traditional media. *Id.* at 407. Accordingly, the Third Circuit held that "[o]n remand, the Commission must either exclude the Internet from the media selected for inclusion in the Diversity Index or provide a better explanation for why it is included in light of the exclusion of cable." *Id.* at 408. As a factual matter, one might object that the Third Circuit is mischaracterizing much of what the Internet has to offer. Cf. *id.* at 406 n.34 (describing the *Drudge Report*, an online source identified by the FCC as an aggregator of news stories). Again, however, these considerations are outside the scope of this Article, although an adequate formula for measuring media diversity may be a useful component in a broader reconsideration of the FCC's role in regulating media diversity on these grounds. See *infra* note 66 and accompanying text.

14. 373 F.3d at 403.

market was assigned an equal 4.3% share of the television market.¹⁵ The FCC then multiplied the assigned market shares of the outlets within each media type by the relative weight for that type.¹⁶ Continuing the prior example, each broadcast television market share in New York City would be multiplied by 33.8% (.338) in order to calculate its weighted market share.¹⁷

The FCC then derived the weighted ownership shares of a single entity by combining the weighted market shares of all of the media outlets owned by that entity.¹⁸ So, for example, ABC owned one television station and four radio stations in New York City.¹⁹ The FCC combined ABC's weighted television share with its weighted radio share (4.3% multiplied by .338, which equals 1.45% for the weighted television share combined with a total of 6.7% for four radio stations multiplied by .249 for the radio market weight, which equals 1.67%).²⁰ Accordingly, the FCC assigned a total weighted ownership share of 3.12% to ABC's combination.²¹

Finally, the FCC summed the squares of the weighted ownership shares to calculate the market's Diversity Index score.²² New York City, for example, received a total Diversity Index score of 373, to which ABC's squared weighted ownership share had contributed 9.8 points.²³ The FCC also used this methodology to calculate Diversity Index scores for several media markets of different sizes, measuring market size by the number of television stations in the market.²⁴

15. *Id.* The Third Circuit ultimately held that the FCC could not justify its use of these assigned equal shares rather than actual-use data in each market and remanded on this ground as well. *See id.* at 408–09. This was an independent ground for remand, however, and all of the other considerations in this Article should apply if the FCC adopts an actual-use methodology for determining an outlet's market share. As an aside, one can note that the effect of assuming equal shares rather than using actual-use data would be to understate concentration as measured by the Diversity Index. *See infra* Table 1 (showing that a market with ten equally-weighted outlets would receive a lower Diversity Index score and thus be deemed more diverse than a market with ten outlets and an uneven distribution of shares).

16. *See* 373 F.3d at 404.

17. *Id.*

18. *See id.*

19. *Id.*

20. *Id.*

21. *Id.*

22. *Id.*

23. *See Order, supra* note 2, app. C.

24. *See* 373 F.3d at 404 (citing *Order, supra* note 2, app. D). Appendix C of the *Order* also contains sample calculations for ten of these markets. *Order, supra* note 2, app. C.

2. Consolidation Scenarios

Next, the FCC looked at how the markets' Diversity Index scores would change given different hypothetical consolidation scenarios.²⁵ The FCC considered seven possible combinations: (1) one newspaper and one television station; (2) one television station and all of the radio stations allowed under the local radio rule;²⁶ (3) one newspaper and all of the radio stations allowed under the local radio rule; (4) one newspaper, one television station, and half of the radio stations allowed under the local radio rule; (5) two television stations; (6) one newspaper and two television stations; and (7) one newspaper, two television stations, and all of the radio stations allowed under the local radio rule.²⁷ To determine the hypothetical effects of such combinations on media diversity, the FCC compared the Diversity Index scores of the markets before and after the combinations; the difference, an increase in the Diversity Index score, provided the FCC's measure of the loss of diversity due to the consolidation scenario.²⁸

3. The Cross-Media Limits

Finally, the FCC set the Cross-Media Limits, which varied with the size of the market, purportedly based on whether or not the relevant consolidation scenarios "resulted in acceptable increases to the average Diversity Index score[]" for that size of market.²⁹ For markets with three or fewer television stations, the FCC prohibited all newspaper/television, newspaper/radio, and radio/television combinations.³⁰ In markets with nine or more television stations, the FCC imposed no limits on cross-media ownership.³¹ In markets with four to eight television stations, the FCC rule allowed all of the scenarios except for two: a combination of a newspaper and two television stations, or a combination of a newspaper, two television stations, and all of the radio stations allowed under the local radio rule.³²

25. 373 F.3d at 404.

26. The local radio ownership rule is an independent rule, established by statute, which limits the number of commercial radio stations a single entity can own in a market based upon the total number of commercial radio stations in that market. *Id.* at 387 n.9 (citing the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 110 (codified at scattered sections of 47 U.S.C.)).

27. 373 F.3d at 404 (citing *Order*, *supra* note 2, app. D).

28. *See id.*

29. *See id.*

30. *Id.*

31. *Id.*

32. *Id.* (citing *Order*, *supra* note 2, para. 466). Obviously, these are not separate rules. The rule prohibiting a combination of a newspaper and two television stations also prohibits a combination of a newspaper, two television stations, and any additional media outlets.

B. *The Third Circuit's Review*

After analyzing the Diversity Index and its use by the FCC, the Third Circuit held that the FCC: (1) had not justified its choice and weighting of the specific kinds of media outlets to include in the Diversity Index; (2) had not justified its assumption of equal market shares among media outlets of the same kind for the purposes of calculating the Diversity Index; and (3) had not rationally derived the Cross-Media Limits from the Diversity Index results.³³ The last of these three holdings is the focus of this Subpart.

The Third Circuit held that “[a]lthough the Commission is entitled to deference in deciding where to draw the line between acceptable and unacceptable increases in markets’ Diversity Index scores, we do not affirm the seemingly inconsistent manner in which the line was drawn.”³⁴ To support this conclusion, the Third Circuit highlighted the FCC’s chart of the effects of different “consolidation scenarios.”³⁵ As the Third Circuit noted, the proposed “Cross-Media Limits allow[] some combinations where the increases in Diversity Index scores were generally higher than for other combinations that were not allowed.”³⁶

The court particularly noted that in midsized markets, the markets with four to eight television stations, one combination—a newspaper, television station, and half of the radio stations allowed under the local radio rule—allowed by the FCC’s rule caused “considerably higher” Diversity Index score increases than the other combinations allowed by the FCC.³⁷ In fact, this combination generally led to higher increases than a combination that the FCC did not allow—a newspaper and two television stations.³⁸

The Third Circuit concluded that “[t]he Commission’s failure to provide any explanation for this glaring inconsistency is without doubt arbitrary and capricious, and so provides further basis for remand of the Cross-Media Limits.”³⁹ The court rejected the argument that the relevant difference between a combination of a newspaper and two television stations and a combination of a newspaper, one television station, and half of the allowed radio stations is that “a newspaper will benefit more from . . . the consolidation with its first-acquired TV station than with

33. *See id.* at 404–11.

34. *Id.* at 411.

35. *Id.* at 409–10 (citing *Order, supra* note 2, app. D). *See also infra* Table 2 (reproducing the FCC’s chart).

36. 373 F.3d at 411.

37. *Id.*

38. *Id.*

39. *Id.*

subsequently acquired stations.”⁴⁰ The court concluded that this argument “does not address why the newspaper + 1 TV station + 50% allowed radio stations combination was permitted when its Diversity Index score increases were overall much greater than the Diversity Index score increases for other allowed combinations.”⁴¹

As this exchange illustrates, the Third Circuit was implicitly adopting the Diversity Index as an appropriate measure of media diversity and then requiring the FCC to justify any departures from the implied ordering of consolidation scenarios based on this measure. Moreover, the Third Circuit was requiring the FCC to justify not only departures where scenarios with similar effects on Diversity Index scores were treated differently, but also departures where scenarios with dissimilar effects on Diversity Index scores were treated the same—a very robust use of the FCC’s own formula, despite the FCC’s disclaimer that the Diversity Index is “a blunt tool capable only of capturing and measuring large effects or trends in typical markets.”⁴²

C. *The Underlying Issue: A Fatal Flaw in the Diversity Index*

Although the Third Circuit based its holding on inconsistent line-drawing, the court actually understated the underlying problems with the FCC’s use of the Diversity Index. The FCC’s real problem is not finding a consistent line to draw when using the Diversity Index; instead, the Diversity Index itself is fatally flawed because it cannot simultaneously satisfy two underlying assumptions about the relationship between media market share and media diversity. This Subpart first explains how the Diversity Index, as designed by the FCC and adopted by the Third Circuit, was intended to satisfy these two assumptions: (1) diversity in a media market should decrease with ownership concentration; and (2) the contribution to diversity of an individual entity, its diversity importance, should increase with the weighted market shares of that entity’s outlets. Section 2 shows that the Diversity Index as it is currently structured cannot

40. *Id.* at 411 n.41 (citing *Order, supra* note 2, para. 467).

41. *Id.*

42. *Order, supra* note 2, para. 398. *See also* 373 F.3d at 473 (Scirica, J. dissenting in part, concurring in part) (arguing that the Cross-Media Limits were reasonable and should be upheld, even though the Diversity Index results “do not correspond to the Commission’s final rule for all combinations in all markets,” because the Diversity Index nonetheless “lent transparency and empirical footing to this massive undertaking”). The fact that the Third Circuit was willing to use the FCC’s own formula, even with these disclaimers, to justify remanding the FCC’s rule lends support to the claim that adopting a formulaic approach to measuring media diversity can limit the discretion of government officials. *See infra* note 66 and accompanying text.

simultaneously satisfy both of these assumptions. Accordingly, Part II concludes with the suggestion that the FCC should consider alternatives to the Diversity Index.

1. The Two Assumptions Underlying the Diversity Index

On the one hand, the Diversity Index is designed to treat increased ownership concentration in a media market as having a negative impact on diversity. Like the HHI, the Diversity Index sums the squares of the weighted ownership shares. Mathematically, this formula can measure increases in concentration in the market because each entity's contribution to the concentration score before summation does not just increase linearly with its weighted ownership share, in which case the distribution of ownership shares would have no effect on the total score of the market once all of the entities' shares were summed. Rather, each entity's contribution to the concentration score before summation increases exponentially, making the total Diversity Index score of the market following the summation dependent on the distribution of ownership shares.⁴³

On the other hand, the Diversity Index also seems designed to treat higher weighted market shares as representing a greater contribution to a market's diversity. As the Third Circuit noted in *Prometheus*, the FCC, in justifying its relative weighting of media types, stated that it has "no reason to believe that all media are of equal importance"⁴⁴ and that "[n]ot all voices . . . speak with the same volume."⁴⁵ The court further noted that the FCC's stated reason for departing from a simple voice-counting test and moving to the Diversity Index methodology was that it wanted to take into account the "diversity importance" of hypothetical merging parties.⁴⁶ Indeed, the FCC suggested that, for example, "if radio has less diversity weight than television, then a merger of a television station and a radio station will cause less of a loss of diversity than will a merger of two television stations."⁴⁷

Thus, when the Diversity Index calculates the weighted market shares of media outlets by multiplying the outlets' assigned market shares with weighting factors derived from the consumer popularity of various media sources, it is creating a positive correlation between the weighted market

43. See 373 F.3d at 403 (discussing the mathematical characteristics of the HHI). See also *infra* Table 1 (providing sample calculations using the Diversity Index).

44. 373 F.3d at 408 (citing *Order, supra* note 2, para. 409) (internal quotation marks omitted).

45. *Id.* (quoting *Order, supra* note 2, para. 445) (internal quotation marks omitted).

46. *Id.* (quoting *Order, supra* note 2, para. 396).

47. *Order, supra* note 2, para. 396.

share of an outlet and the calculated "importance" of that outlet, or the "volume" of that voice, in the market. Consequently, this portion of the Diversity Index scheme assumes that there should be a positive correlation between a media outlet's weighted market share and the magnitude of its contribution to diversity in the market.

The FCC did not clearly explain why it believed that greater actual use of an outlet, as represented by its market share, should represent greater diversity importance. The FCC stated, "[O]ur method for measuring viewpoint diversity weights outlets based on the way people actually use them rather than what is actually available as a local news source. We adopt this approach out of an abundance of caution because we are protecting our core policy objective of viewpoint diversity."⁴⁸ But the FCC had previously stated in its *Order* that "[v]iewpoint diversity refers to *availability* of a wide range of information and political perspectives on important issues,"⁴⁹ and that "what ultimately matters here is the range of choices *available* to the public"⁵⁰ Accordingly, despite the FCC's claim that it was adopting this actual-use methodology out of an "abundance of caution," it appears that the FCC was in fact implicitly redefining viewpoint diversity by shifting its focus to the actual use of media outlets.⁵¹

The Third Circuit implicitly reached a similar conclusion when it criticized the FCC's assignment of equal market shares within each media type because that assignment generated "absurd results."⁵² Focusing on the New York City market, the court compared a community college television station's weighted ownership share of 1.5% with the New York Times

48. *Id.* para. 399.

49. *Id.* para. 393 (emphasis added).

50. *Id.* para. 394 (emphasis added).

51. *Id.* para. 399. Assessing whether this was a permissible or justifiable revision of the FCC's definition of viewpoint diversity is outside the scope of this Article. *Cf. FCC v. Nat'l Citizens Comm. for Brdcast.*, 436 U.S. 775, 796-97 (1978) ("Diversity and its effects are . . . elusive concepts, not easily defined let alone measured") (quoting *Nat'l Citizens Comm. for Brdcast v. FCC*, 555 F.2d 938, 961 (D.C. Cir. 1977)). Nonetheless, it may be worth observing that the FCC describes its diversity goal as "fostering competition in the marketplace of ideas." *Order, supra* note 2, para. 393 (internal quotations omitted). Obviously, that metaphorical market does not include only media outlets on the supply side and media consumers on the demand side. Instead, presumably, once media outlets have supplied information or perspectives to their consumers, many of those consumers will then resupply those ideas to other participants in this marketplace. In that sense, ideas first transmitted through media outlets with a larger market share will be more competitive simply by virtue of having a larger number of resuppliers in these second-stage transactions. In other words, there is a straightforward sense in which ideas first transmitted by relatively unpopular media outlets will be less available to second-stage consumers of ideas.

52. 373 F.3d at 408.

Company's weighted ownership share, derived from a co-owned newspaper and radio station, of 1.4%.⁵³ The court concluded, "A Diversity Index that requires us to accept that a community college television station makes a greater contribution to viewpoint diversity than a conglomerate that includes the third-largest newspaper in America also requires us to abandon both logic and reality."⁵⁴ Consequently, the court also appears to have concluded that an entity's weighted ownership share should correlate positively with the magnitude of that entity's contribution to diversity.⁵⁵

2. The Diversity Index Cannot Simultaneously Satisfy These Two Assumptions

The Diversity Index scheme, as used by the FCC, cannot simultaneously satisfy these two assumptions: (1) diversity in a media market should decrease with ownership concentration; and (2) the contribution to diversity of an individual entity should correlate positively with the weighted market shares of that entity's outlets. By calculating the Diversity Index score as the sum of the squares of the weighted ownership shares, the Diversity Index score contribution of a given entity increases exponentially with the weighted market shares of its outlets. Consequently, the Diversity Index score positively correlates with both increased ownership concentration, as traditionally measured by the HHI formula, and increased weighted market shares on an outlet-by-outlet basis. Increases in the Diversity Index score of a media market could thus be treated as representing decreases in diversity, in accordance with Assumption (1). But such a scheme, by implication, would treat an individual entity's contribution to diversity as correlating negatively, not positively, with the weighted market shares of its outlets, thus violating Assumption (2).⁵⁶ Conversely, treating increases in the Diversity Index

53. *Id.*

54. *Id.* (citations omitted).

55. Again, a critical review of the court's decision is beyond the scope of this Article. But it is certainly worth noting that the court could have questioned this entire approach, perhaps even remanding the case to the FCC on the ground that it had not justified defining viewpoint diversity with respect to actual use of media outlets. Instead, the court not only accepted this definition, but also used it as a substantive basis for reviewing the details of the FCC's Diversity Index methodology.

56. For comparison, it may be worth noting that an HHI analysis of a media market for the purpose of gauging concentration effects would also implicitly treat an entity's individual contribution to those effects as increasing with the market shares of that entity's outlets. Of course, in that context, such an assumption is appropriate. In other words, it would not be objectionable to say that a media company with a large share of the media market, such as the New York Times Company in New York, contributes more to media concentration than a company with a smaller share of the media market. Again, the problem in this context is that the New York Times Company is also, by the assumptions of the Third

score as representing increases in diversity would satisfy Assumption (2), but would then violate Assumption (1).

Consequently, any use of the Diversity Index scheme is bound to violate the basic assumptions of the Third Circuit, and indeed the FCC itself. Accordingly, to truly satisfy the Third Circuit on remand, the FCC should consider alternatives to the Diversity Index. Part III presents two such alternatives, one proposed by Professor Noam and one original to this Article.

III. ALTERNATIVES TO THE DIVERSITY INDEX

As noted in the Introduction, there has been surprisingly little commentary on the Third Circuit's discussion of the Diversity Index and its remand of the Cross-Media Limits. Professor Eli Noam, however, broadly addressed the FCC's attempts to measure media market diversity in a column for the *Financial Times* Online edition.⁵⁷ Professor Noam was not primarily concerned with the issues discussed in this Article, but he also proposed an alternative to the Diversity Index. Accordingly, this Part begins with Professor Noam's analysis of the Diversity Index and his proposal of an alternative, which I will call the Noam Index ("NI").⁵⁸ Subpart B then proposes an original index specifically designed to simultaneously satisfy the two assumptions of the FCC and Third Circuit.

A. *The Noam Index*

Professor Noam identified two problems with the Diversity Index. Noting that the Diversity Index is based on the HHI used in conventional analysis of market concentration for antitrust purposes, he stated, "[t]he issue is partly whether the concentration threshold for media should be lower, and also whether the HHI methodology itself accounts sufficiently for media pluralism."⁵⁹ Addressing the second issue, Professor Noam argued that while the HHI is a good measure of market power, it fails to properly account for pluralism.⁶⁰ Contending that both pluralism and

Circuit and FCC, contributing more to the diversity of that market than entities owning less "important," or lower "volume," media outlets.

57. Eli Noam, *How to Measure Media Concentration*, FT.COM, Aug. 30, 2004, <http://www.ft.com/cms/s/da30bf5e-fa9d-11d8-9a71-00000e2511c8.html> (last visited Oct. 4, 2005). Noam is a Professor of Economics and Finance at the Columbia Business School and Director of the Columbia University Institute for Tele-Information.

58. Following the convention established with the HHI, I will use personal names to identify the indices in this Article, with the exception of the Diversity Index.

59. Noam, *supra* note 57. This Article focuses primarily on the second of these issues.

60. *Id.* Professor Noam described an example of a radio market:

[I]f [] two smaller stations were replaced by 20 stations, each with 1 per cent [sic] of the market, the HHI would decline only slightly, from 3400 to 3220. Yet the

market power are important considerations, he concluded that “one should not have to choose between a measure of market power (the HHI) or of pluralism”⁶¹

Accordingly, Professor Noam proposed an alternative to the Diversity Index that incorporates both concerns. The NI takes the HHI as a measure of market power and then divides it by the square root of the number of voices in the market.⁶² As Professor Noam explained, the more voices there are in a market, the lower the NI score will be.⁶³ To provide for a practical test, he advocated limiting the counting of voices to those above a certain size threshold, and he proposed 1%.⁶⁴ Finally, he proposed that this same approach could be used for cross-media analysis, “since a company might have no special market power in any particular medium but be involved in several media so that overall it would hold significant power, especially if it were to have multiple holdings in one city.”⁶⁵

As an aside, it is worth noting that the NI does not appear to deal with the underlying problem identified in this Article—the inability of the Diversity Index to simultaneously satisfy Assumptions (1) and (2). Rather, the NI is designed to give extra weight to the loss or addition of voices when assessing media concentration. But the NI provides a useful comparison for the purposes of this Article because it is also a formulaic alternative to the Diversity Index, designed to fulfill the same basic purpose—measuring the media diversity of individual markets. Professor Noam argued broadly in favor of such an approach:

[To some], any numerical test is suspect as mechanistic. They would prefer a case-by-case consideration of many factors relevant to a media market. But this would leave a judgment call over media ownership to government officials able to reward friends and punish enemies, or enable powerful media companies to thwart unfavourable decisions—both undesirable options given the inherently adversarial relationship of government and media. This argues for a relatively clear-cut test, with a relatively clear-cut methodology.⁶⁶

diversity of the local radio market would clearly be significantly increased by the presence of 18 additional radio station providers.

Id.

61. *Id.*

62. *Id.* See also *infra* Table 1 (using sample calculations for the Noam Index).

63. Noam, *supra* note 57.

64. *Id.* Unfortunately, Professor Noam did not specify exactly how this percentage should be calculated.

65. *Id.* Professor Noam did not explain exactly how his index would apply to the cross-media case, but this Article will assume that the NI could be applied to weighted market shares as determined by the FCC.

66. *Id.* In response to Professor Noam, Professor Richard Epstein argued that in light of the online media market, including such entities as “bloggers,” the actual number of media

Accepting the potential benefits of such formulaic approaches, the next section of this Article proposes another alternative to the Diversity Index—one specifically designed to address the underlying assumptions of the Third Circuit and the FCC.

B. *The Hill Index*⁶⁷

Holding aside the issues of how to select media types, how to weigh those types, and then how to assign market shares to outlets within those types, we can assume that the FCC started with appropriately-weighted market shares.⁶⁸ As with the Diversity Index and the NI, the Hill Index (“HI”) would combine the weighted market shares of co-owned outlets to derive weighted ownership shares. However, instead of summing the squares of these shares, the HI would sum the square roots of these shares.⁶⁹

As with the Diversity Index, an individual entity’s contribution to the market’s HI score would increase with the entity’s weighted market share. Accordingly, under Assumption (2), increases in this modified Diversity Index score should be treated as representing increases, not decreases, in diversity. In other words, a greater HI score represents a more diverse market, and a lower HI score represents a less diverse market.⁷⁰

voices is much larger than Professor Noam assumes. Richard A. Epstein, *No Need to Fight Yesterday’s Wars*, FT.COM, Aug. 30, 2004, <http://news.ft.com/cms/s/da30bf5e-fa9d-11d8-9a71-00000e2511c8.html> (last visited, Oct. 20, 2005). Also in response to Professor Noam, Thomas Hazlett argued that the broader context is a “regulatory failure” in the broadcast segment of the media market, and he concluded that courts should extend the protections of the First Amendment from print media to all “communications.” Thomas W. Hazlett, *The ‘Noam Index’*, FT.COM, Aug. 30, 2004, <http://news.ft.com/cms/s/da30bf5e-fa9d-11d8-9a71-00000e2511c8.html> (last visited, Oct. 4, 2005). Taken together, these responses suggest that the proper conclusion may be that there should be a more limited role for the FCC in this area, and perhaps no role at all. Although such an argument is mostly outside the scope of this Article, it is worth noting that a formulaic approach to measuring media diversity, properly applied in light of actual facts, may bolster such arguments. See *infra* Part V. In that sense, Professor Noam’s observation that a formulaic approach limits the ability of government officials to “reward friends and punish enemies” applies equally well to these broader questions of whether the government should be regulating at all. Noam, *supra* note 57.

67. At the risk of seeming immodest, this Article will continue to use the convention of identifying indices by proper names for the sake of clarity.

68. Examining these prior steps is beyond the scope of this Article, but it is worth noting that doing so would be one way to initiate the broader discussion of whether any ongoing regulation in these areas is warranted. See generally Epstein, *supra* note 66. See also *supra* notes 13, 15, 66, and accompanying text.

69. See *infra* Table 1 (comparing, side-by-side, the formulas used in the Diversity Index, NI, and HI).

70. It may be important to stress the contrast between the HI and the Diversity Index and NI. In both of the latter indices, a greater score indicates a less diverse market. With the

With the HI formula, an entity's contribution to diversity increases in a diminishing, not increasing, fashion as its weighted ownership share increases.⁷¹ As a result, treating increases in the HI score as representing increases in diversity would not violate Assumption (1). Indeed, decreases in the HI score could be treated as representing decreases in diversity under both assumptions.

For example, a media market with only one outlet, and thus with a weighted ownership share of 100, would have an HI score of 10 (the square root of 100). For comparison, using the same share of 100 in the Diversity Index formula would result in a score of 10,000 (the square of 100). Moving to a market with 10 separately-owned outlets, each with an equal weighted share of 10, the HI score would *increase* to 31.6 (the sum of 10 square roots of 10). By contrast, the Diversity Index score would *decrease* to 1,000 (the sum of 10 squares of 10). Similarly, moving then to a market still with 10 separate outlets, but one with a weighted share of 50, one with a share of 10, and the remaining 8 with shares of 5, would result in a *decrease* in the HI score to 28.1, and an *increase* in the Diversity Index score to 2,800. Alternatively, moving from a market with 10 equal outlets to a market with 8 equal outlets, each with a share of 12.5, would result in a *decrease* of the HI score to 28.3, and an *increase* of the Diversity Index score to 1,250.⁷²

As this example demonstrates, treating decreases in the HI score as decreases in diversity is consistent with the assumption that increases in ownership concentration in media markets correlate with decreases in media diversity. Unlike both the Diversity Index and the NI, the HI accommodates both of the assumptions shared by the Third Circuit and FCC.

In order to determine whether the HI is useful in practice, including for the purpose of evaluating the effects of consolidation scenarios, it must be tested. Part IV considers the results of applying all three indices to a sample market: Altoona, Pennsylvania.

HI, in contrast, a greater score indicates a more diverse market. *See infra* Table 1 (comparing sample calculations for all three indices).

71. For example, an entity with a weighted ownership share of 10 would contribute 3.16 (the square root of 10) to the HI score. Increasing the entity's weighted ownership share to 20 would increase its contribution to 4.47—an increase of 1.31. But then increasing its share from 20 to 30 would only increase its contribution to 5.48—a further increase of 1.01. As this example demonstrates, the marginal increase in its contribution to the HI score decreases as an entity grows, a mathematical consequence of using the square root function.

72. *See infra* Table 1 (comparing the sample calculations across the Diversity Index, NI, and HI).

IV. A TEST CASE: ALTOONA, PENNSYLVANIA

The natural next step would be to apply the NI and HI to all of the data underlying the FCC's chart of consolidation scenarios, comparing the results with the Diversity Index. Unfortunately, the FCC did not provide all of this information in its published *Order*.⁷³ However, the FCC did provide sample base Diversity Index calculations for ten markets in Appendix C of the *Order*. For one of those ten markets—Altoona, Pennsylvania—the FCC also provided two sample calculations for hypothetical consolidation scenarios.⁷⁴ As it turns out, Altoona is a suitable test case for the NI and HI because it fits within the range of markets subject to the rules held inconsistent by the Third Circuit: Altoona has six television stations, placing it within the disputed range.⁷⁵

This Part begins by confirming that the application of the Diversity Index to the Altoona market leads to the same sort of inconsistent results that the court identified with respect to the FCC's Cross-Media Limits. Subpart B then applies the NI and HI to the Altoona market, comparing the results given the relevant consolidation scenarios. On the basis of this comparison, this Part confirms that only the HI simultaneously satisfies the two basic assumptions shared by the FCC and the court. Moreover, this Part also concludes that the HI puts greater practical weight on the loss of voices than the NI, and thus is also better-suited to address the issues of media pluralism that motivated Professor Noam to create an alternative index.

A. *Altoona and the Diversity Index*

Before applying the NI and HI to the Altoona market, it is necessary to check whether applying the Diversity Index to the combination scenarios as applied in Altoona would lead to results comparable to those represented in the FCC's summary chart. One immediate difficulty is that there are not unique ways to carry out the scenarios described by the FCC. Altoona apparently has both a daily and a weekly newspaper, although the weekly newspaper remained unnamed in the FCC's chart, and thus the combinations involving a newspaper could take two different forms.⁷⁶ Similarly, combinations involving multiple radio stations could be created out of different combinations of the existing radio groups. For example, the

73. See *Order*, *supra* note 2, app. D.

74. See *Order*, *supra* note 2, app. C.

75. See *Order*, *supra* note 2, app. C. See also *infra* Table 3 (reproducing the FCC's analysis of the Altoona media market).

76. See *Order*, *supra* note 2, app. C. See also *infra* Table 3.

local radio rule allows a combination of up to five stations,⁷⁷ and in Altoona this result could be reached by combining three independent stations with one two-station group, or an independent station with a four-station group, and so on. Finally, combinations involving two television stations could be formed by acquiring two independent stations, or one two-station group.

To resolve these issues, this Article calculates results using several different scenarios, taking the average of the results. So, for combinations involving a newspaper, scenarios for each newspaper were calculated. For combinations involving two television stations, scenarios were calculated both for combining two independent stations and for one two-station group. Hence, for the combination involving a newspaper and two television stations, four scenarios were calculated, as a result of compounding both of these rules.

For the radio combinations involving five stations, scenarios for a 1-1-1-2 combination and 1-4 combination were calculated. For radio combinations involving three stations, scenarios for a 1-1-1 combination and a single three-station group were calculated. Again, when combined with the newspaper rule, this rule resulted in four possible scenarios.⁷⁸

As noted above, this Article also uses combinations involving three stations when calculating the scenario involving acquisition of half of the radio stations allowed by the local rule. Half of the five stations allowed by the local rules would have been 2.5 stations, and it is unclear whether the FCC intended to round up or down in such circumstances. However, as it turned out, the Altoona market failed to mirror the results of the FCC's chart when only two stations were used. Since, as discussed below, using three stations did bring Altoona into alignment with the chart results, that interpretation was adopted for the sake of this test case.

The result of applying these rules to the Altoona market is shown in Table 4. As noted by the Third Circuit with respect to the overall chart, a combination of a newspaper, television station, and half of the allowed radio stations, three in this test case, led to a greater average increase in the

77. Because Altoona has fourteen radio stations, the local radio ownership rule provides that a single party can own up to five stations. 373 F.3d at 387 n.9 (citing Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. at 110 (codified at scattered sections of 47 U.S.C.)).

78. As an aside, this Article did not calculate results for two combinations on the FCC chart: the newspaper, radio, and two television station combination, and the two television station combination. The first combination was uncontroversially prohibited, and calculating the results after applying the above rules would have required eight scenarios. The second combination was uncontroversially allowed and mathematically uninteresting. *See generally id.* at 411 (reviewing the FCC's chart).

Diversity Index (386) than a combination of a newspaper and two television stations (356). Similarly, the former combination led to a considerably higher average increase than any of the other allowed combinations: a television station and five radio stations (142), a newspaper and five radio stations (297), or a newspaper and one television station (162). As a result, the Altoona market seems to present a specific case of the general problem identified by the Third Circuit, at least when the FCC's combination scenarios are interpreted as above.

B. *Applying the Noam and Hill Indices*

Having confirmed that Altoona is a suitable test case, this Subpart applies the NI and HI to the Altoona market. The results of applying the NI and HI are also summarized in Table 4.

The NI starts with a base of 240—the HHI score of 960 divided by the square root of the number of voices. Since there are 16 voices in Altoona the base-case denominator in the NI is 4.⁷⁹ The average change in the NI for each combination is represented as a positive number, indicating a loss of diversity. The HI starts with a base of 37.73.⁸⁰ As noted above, the average change in the HI for each combination is negative, also representing a loss of diversity.

One obvious question is whether either the NI or the HI could shield the FCC from the Third Circuit's conclusion that the FCC engaged in inconsistent line-drawing. The answer is no. Both alternative indices led to the same result: a combination of one newspaper, one television station, and three radio stations averaged higher than a combination of one newspaper and two television stations, and substantially higher than any other allowed combination.

With the details of the Altoona market before us, it is now obvious why this result occurs. The three additional radio stations have approximately the same total weighted share (5.4) as the one additional television station (5.6).⁸¹ Accordingly, a combination of a newspaper, television station, and three radio stations will result in a media group with approximately the same weighted share as a combination of a newspaper

79. Note that the Internet is represented by two voices: cable and "other." Although this approach accords with the general methodology of the FCC, and although commentary on that methodology is outside the scope of this Article, it is once again worth noting that this analysis is controversial at best. See generally Epstein, *supra* note 66.

80. See *infra* Table 5 (breaking down the Altoona market as analyzed by the HI).

81. The numbers underlying these calculations are found in Table 5. A single radio station has a weighted share of 1.779. Thus, three radio stations would have a weighted share of 5.4 (after rounding). As Table 5 also indicates, a single independent television station has a weighted share of 5.633, or 5.6 after rounding.

and two television stations. However, the former combination will, on average, eliminate more independent outlets than the latter. For that reason, by any of these measures, the former will lead to a greater net loss of diversity.

The NI only underscores this effect by giving greater weight to the greater loss of voices caused by the radio combination. The HI leads to the same result because the positive benefits of creating a combination with a greater weighted share are approximately equal in each case, allowing the loss of additional voices to dominate. All three indices support the Third Circuit's holding that the FCC had drawn an inconsistent line by allowing this particular combination.

The various indices do, however, disagree on other issues. According to the Diversity Index, the next-worst combination is the combination of a newspaper and two television stations, a combination the FCC sought to prevent. In contrast, the next-worst combination for both the NI and HI is the combination of a newspaper and all the radio stations allowed by the local rule. As it was designed to do, the NI picked out a scenario which led to a significant reduction in the number of voices. The HI reached the same result for a slightly different reason: the radio stations each added relatively little to the voice of the newspaper, so the marginal increase in the voice of the combination was heavily outweighed by the loss of the independent voices.⁸² The NI and HI both indicate that the FCC should also reconsider allowing this combination but prohibiting a combination of newspaper and two television stations.⁸³

So far in this discussion, both the NI and HI have lived up to their intended purposes. At the next stage, however, the NI arguably breaks down. After the newspaper and full radio combination, the next-worst combination for the HI is the television station and full radio combination. Somewhat surprisingly, however, the next-worst combination for the NI is not that combination, but rather the newspaper and two television station combination—even though the combination picked out by the HI results in the loss of more voices.⁸⁴

82. For example, the combined daily newspaper and radio group contributed 5.398 points to the HI score. Separately, the components of this group had been contributing either 10.388 points (1-1-1-2 scenario) or 8.501 points (1-4 scenario). Similarly, the combined weekly newspaper and radio group contributed 4.177 points to the HI score. Separately, the components had been contributing either 8.813 or 6.926. *See infra* Table 5.

83. Of course, the FCC could address this problem in several different ways: disallowing both combinations; allowing both combinations; or, inverting its prior rule by allowing combinations of a newspaper and two television stations, but disallowing combinations of a newspaper and all the radio stations allowed under the local radio rule.

84. It may be worth recalling that Professor Noam had provided an example of media pluralism based on increasing the number of radio stations. *See* Noam, *supra* note 57.

This occurs because the HHI, as indicated by the Diversity Index, increases more rapidly in response to the combination of one big player (a newspaper) and two medium players (the television stations) than it does to the combination of one medium player (the television station) and five small players (the radio stations). In the NI, the numerator's rapid increase, which is a consequence of the summing of the squares of combined market shares, can outweigh the denominator's gradual decrease, which is a consequence of taking the square root of the number of voices.

In the HI, by contrast, the fact that the combination resulting from a television station and five radio stations is smaller than the combination resulting from a newspaper and two radio stations actually counts against the former. That is because the lower strength of the smaller combination's voice is more easily outweighed by the loss of additional voices.⁸⁵

In summary, like the Diversity Index, the NI violates Assumption (2) by treating larger combinations as contributing less to diversity. As a result of doing so, it arguably violates its own preference for a greater number of voices: it treats increasingly large combinations as an increasing problem, while treating a diminishing number of voices as a diminishing problem. In contrast, as discussed above, the HI simultaneously satisfies both Assumption (1) and Assumption (2). Moreover, the HI can actually put greater practical weight on the loss of voices than can the NI. When an increasing number of small voices are combined, the HI registers for each additional voice a fixed loss of diversity and a decreasing marginal benefit in terms of the "strength" of the combined voice. Consequently, the HI both provides an internally consistent measure of media diversity and also effectively fosters media pluralism.

V. CONCLUSION

As Professor Noam implied, a formulaic test for media diversity could have the beneficial effect of constraining government regulators who might, intentionally or unintentionally, abuse excessive discretion. In *Prometheus*, the Third Circuit, somewhat surprisingly, did not defer to the FCC's discretion with respect to the Cross-Media Limits, and that decision was facilitated by the FCC's inconsistent use of a formulaic test, the

85. The combined television and radio group contributed only 3.811 points to the HI score; whereas, individually the components had contributed 8.261 (1-1-1-2) or 6.374 (1-4). In contrast, the newspaper and two television station groups contributed 5.614 (daily) and 4.452 (weekly), compared with a prior total of either 9.246 (daily plus 1-1) and 7.857 (daily plus 2), or 7.671 (weekly plus 1-1) and 6.282 (weekly plus 2). In other words, according to the HI, the diversity lost through combination was roughly equivalent in each of these cases, but the strength of the resulting combination was lower for the television and radio group, resulting in a greater net diversity loss for that combination. See *infra* Table 5.

Diversity Index. But the court also implicitly undermined the entire Diversity Index scheme because the Diversity Index fails to coherently reflect the assumptions of the court, and indeed the FCC itself, with respect to diversity in media markets.

Placing this discussion in a broader context, Professor Noam suggested important considerations of pluralism that also militate in favor of adopting an alternative to the Diversity Index. Although Professor Noam suggested his own index, the Altoona test case indicates that the HI not only reconciles the assumptions of the Third Circuit and the FCC, unlike the NI, but also surpasses the NI itself with respect to protecting media pluralism.

However, determining the most appropriate index of media diversity is only the first step in a broader project. With a proper understanding of the facts of media markets, applying an appropriate index may do more than simply sort the possible regulations with respect to something like cross-media ownership. Rather, applying such an index may suggest that in light of modern media markets, no such regulations are warranted. The first step in making such an argument, however, is to find a rule which can reasonably and effectively be used to bind the regulators.

TABLE 1
SIDE-BY-SIDE COMPARISON OF DIVERSITY INDEX, NOAM INDEX, AND
HILL INDEX, WITH SAMPLE CALCULATIONS

	Diversity Index	Noam Index	Hill Index
Formula (w=weighted market share)	$\Sigma(w^2)$	$(\Sigma(w^2))/\sqrt{N}$ (N=number of outlets)	$\Sigma(\sqrt{w})$

Examples

1 x 100	$100^2 = 10000$	$10000/\sqrt{1} = 10000$	$\sqrt{100} = 10$
10 x 10	$10 \times (10^2) = 1000$	$1000/\sqrt{10} = 316$	$10 \times \sqrt{10} = 31.6$
50, 10, 8 x 5	$50^2 + 10^2 + 8 \times (5^2)$ = 2800	$2800/\sqrt{10} = 885$	$\sqrt{50} + \sqrt{10} + 8 \times$ $\sqrt{5} = 28.1$
8 x 12.5	$8 \times (12.5^2) = 1250$	$1250/\sqrt{8} = 442$	$8 \times \sqrt{12.5} = 28.3$

Source: The figures are derived from sample calculations. The entries in the grid apply the formula in the first (boxed) row to the numbers in the first column.

Note: For Diversity and Noam Indices, higher scores represent less diversity. For the Hill Index, higher scores represent more diversity. Note that the numerator for the Noam Index is always equal to the Diversity Index score.

TABLE 2
 REPRODUCTION OF THE FCC CHART SUMMARIZING
 AVERAGE CHANGES IN DIVERSITY INDEX GIVEN VARIOUS
 HYPOTHETICAL CONSOLIDATION SCENARIOS

Base Case		Average Change in Diversity Index, Resulting from Mergers						
TV stations in market	Average Diversity Index score	100% Radio + 1 TV station	Newspaper + 100% Radio	Newspaper + 1 TV station	Newspaper + 1 TV station + 50% Radio	2 TV stations	Newspaper + 2 TV stations	Newspaper + 100% Radio+2 TV stations
1	1701	651	271	910	1321			
2	1316	301	335	731	1009			
3	1027	390	242	331	515			
4	928	138	236	242	408			
5	911	111	263	223	393	91	376	846
6	889	79	239	200	340	63	357	688
7	753	73	171	121	247	47	242	533
8	885	79	299	152	314	36	308	734
9	705	64	198	86	207	28	172	473
10	635	56	107	51	119	23	101	292
15	595	43	149	48	145	10	97	302
20	612	49	222	40	128	6	80	350

Source: *Prometheus*, 373 F.3d at 409–10 (citing *Order*, *supra* note 2, app. D).

Note: Shaded areas indicate combinations prohibited by the FCC’s proposed rules. Dark boxes indicate areas of contention where the Third Circuit found that the FCC had drawn an inconsistent line.

TABLE 3
REPRODUCTION OF FCC'S CHART ANALYZING THE ALTOONA, PA
MEDIA MARKET.

Media Market		Ownership Shares			Percentage Share of Media Market		
% of Media	% of Medium	Parent Company	# of Stations	% Share	%Share (AxBxE)	Cross Ownership	Col. F Squared
A	B	C	D	E	F	G	H
Television 33.8%	Broadcast 100.0%	Clear Channel Communications	1	16.7	5.6		31.7
		Cornerstone TV, Inc.	1	16.7	5.6		31.7
		Cox Broadcasting	1	16.7	5.6		31.7
		Peak Media LLC	2	33.3	11.3		126.9
		Penn State University	1	16.7	5.6		31.7
Radio 24.9%		Allegheny Mountain Network	3	21.4	5.3		28.5
		Altoona Trans Audio Corp Inc	1	7.1	1.8		3.2
		B&F Enterprises	1	7.1	1.8		3.2
		Forever Broadcasting Incorporated	4	28.6	7.1		50.6
		Martinsburg Broadcasting	2	14.3	3.6		12.7
		Sounds Good Incorporated	1	7.1	1.8		3.2
		Vital Licenses	2	14.3	3.6		12.7
Newspaper 28.8%	Daily 70.3%	Altoona Mirror	1	100.0	20.2		409.9
	Weekly 29.7%	Weekly Newspaper	1	100.0	8.6		73.2
Internet 12.5%	Cable 18.3%	Cable	1	100.0	2.3		5.2
	Other 81.7%	Dial-up, DSL, and other	1	100.0	10.2		104.3
Cross-Ownership		None					
Diversity Index (Sum of Column H)							960

Source: Order, supra note 2, app. C.

TABLE 4
 AVERAGE CHANGE IN INDICIES RESULTING FROM HYPOTHETICAL
 CONSOLIDATION SCENARIOS IN THE ALTOONA MEDIA MARKET

Index	Base Case	100% Radio plus 1 TV Station	100% Radio plus Newspaper	Newspaper plus 1 TV station	Newspaper plus 1 TV station plus 50% Radio	Newspaper plus 2 TV stations
Diversity	960	142	297	162	386	356
Noam	240	66	110	50	134	106
Hill	37.73	(3.51)	(3.87)	(1.66)	(4.24)	(2.73)

Source: Order, supra note 2, app. C. The basic methodology for applying each index is explained throughout this Article.

Note: Again, increases in the Diversity and Noam Indices represent a loss of diversity, as do decreases in the Hill Index.

TABLE 5
ANALYSIS OF ALTOONA MEDIA MARKET USING HILL INDEX

Media Weights		Ownership Shares			HI Analysis	
% of Media	% of Medium	Parent Company	# of Outlets	% Share Medium	Weighted Share	Square Root of Weighted Share
Television 33.8%	Broadcast 100%	Clear Channel Communications	1	16.67	5.633	2.373
		Cornerstone TV, Inc.	1	16.67	5.633	2.373
		Cox Broadcasting	1	16.67	5.633	2.373
		Peak Media LLC	2	33.33	11.267	3.357
		Penn State University	1	16.67	5.633	2.373
Radio 24.9%		Allegheny Mountain Network	3	21.43	5.336	2.310
		Altoona Trans Audio Corp Inc	1	7.14	1.779	1.334
		B&F Enterprises	1	7.14	1.779	1.334
		Forever Broadcasting	4	28.57	7.114	2.667
		Martinsburg Broadcasting Incorporated	2	14.29	3.557	1.886
		Sounds Good Incorporated	1	7.14	1.779	1.334
		Vital Licenses	2	14.29	3.557	1.886
Newspaper 28.8%	Daily 70.3%	Altoona Mirror	1	100	20.246	4.500
	Weekly 29.7%	Weekly (no name in data)	1	100	8.554	2.925
Internet 12.5%	Cable 18.3%	Cable (no name in data)	1	100	2.288	1.512
	Other 81.7%	Dial-up, DSL, and other (no names in data)	1	100	10.213	3.196
Hill Index (sum of square roots of weighted ownership shares)						37.733

Source: The first four columns are taken from the FCC's chart for Altoona. See *Order, supra* note 2, app. C. The fifth column is calculated by dividing the number of outlets for the parent company in the fourth column by the total number of outlets in that media type. These figures are identical to those found in the FCC's chart, except that they are taken to an additional significant digit. The sixth column multiplies the media weights in the first two columns with the share in the fifth column. These figures, too, are identical to those found in the FCC's chart, except they are taken to two additional significant digits. Finally, the last column is the square root of the sixth column.

Toward A Limited Right Of Access To Jury Deliberations

Torrence Lewis*

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Nothing in the Constitution prohibits the recording or publication of jury deliberations. As with any other judicial function in our democratic society, the public relies on the work and product of the jury to ensure that justice is done. Unlike any other governmental deliberative process, jury deliberations receive unparalleled protection from the glare of the public eye. An increasing mistrust of the jury has resulted from public displeasure with the results in high profile cases. In addition, access to jurors and the contents of the deliberative process is increasing through the prevalence of postverdict interviews. When freely given, the First Amendment almost insurmountably protects this post-verdict testimony.

Under a contemporary reading of *Richmond Newspapers, Inc. v. Virginia*,¹ faithful to one prong of that majority opinion,² and in

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1. 448 U.S. 555 (1980).

2. The most substantive explication of this “logic” or “structural” prong came from Justice Brennan’s concurrence in *Richmond Newspapers*. Justice Brennan wrote:

[T]he First Amendment embodies more than a commitment to free expression and

consideration of the current "treatment" of jury anonymity,³ a limited right of access should attach to jury deliberations after the end of trial. This right of access should be subject to limitations designed to protect both defendants' fair trial rights and juror privacy and safety.⁴

Discretion whether to permit access to deliberations would thus inhere in much the same way it does in the context of media access to

communicative interchange for their own sakes; it has a structural role to play in securing and fostering our republican system of self-government. Implicit in this structural role is not only 'the principle that debate on public issues should be uninhibited, robust, and wide-open,' but also the antecedent assumption that valuable public debate—as well as other civic behavior—must be informed. The structural model links the First Amendment to that process of communication necessary for a democracy to survive, and thus entails solicitude not only for communication itself, but also for the indispensable conditions of meaningful communication.

Id. 587–88 (Brennan, J., concurring) (citations omitted) (emphasis added). It is arguable that the Court moved closer toward this single-pronged focus in *Globe Newspapers Co. v. Superior Court*, 457 U.S. 596, 605 n.13 (1982) ("Whether the First Amendment right of access to criminal trials can be restricted in the context of any particular criminal trial, such as a murder trial (the setting for the dispute in *Richmond Newspapers*) or a rape trial, depends not on the historical openness of that type of criminal trial but rather on the state interests assertedly supporting the restriction.") (emphasis added). See also *Press-Enter. Co. v. Superior Court (Press Enter II)*, 478 U.S. 1, 21 (1986) (Stevens, J., dissenting) ("The historical evidence proffered in this case is far less probative than the evidence adduced in prior cases granting public access to criminal proceedings."); *El Vocero de Puerto Rico v. Puerto Rico*, 508 U.S. 147 (1993) (holding that despite no history of openness, access attached). For an exhaustive survey of Justice Brennan's contribution, and how it extended from the First Amendment scholarship of Alexander Meiklejohn, see generally Eugene Cerutti, "Dancing in the Courthouse": *The First Amendment Right of Access Opens a New Round*, 29 U. RICH. L. REV. 237, 269 (1995):

In most respects, [the two-prong test] fails to justify the extraordinary extension of the right of access to proceedings and documents with no real history of access and no real utility to the governing process. Many [lower] courts have in fact quite explicitly forsaken the two-prong standard while at the same time extending the right.

(citations omitted); cf. Clifford Holt Ruprecht, *Are Verdicts, Too, Like Sausages?: Lifting the Cloak of Jury Secrecy*, 146 U. PA. L. REV. 217, 237–41 (1997).

3. The historical model of access—"experience"—fails to address modern advances in media culture. Increased access suggests that more and not less information should be available; the reasons for limiting access to jury deliberations are no longer held sacrosanct either by the courts or by the public at large. If the reasons are no longer persuasive, then the question of access to jury deliberations needs to be recast to address that reality. See generally Cerutti, *supra* note 2 (arguing that the right of access needs to be restructured in the interests of doctrinal integrity to account for vast expansions and address claims for more openness in government).

4. Nothing in this proposal implicates the rules prohibiting impeachment of jury verdicts as a legal or judicial matter, nor violates historical concern for jury privacy in the deliberative process. If necessary, juror privacy may still be maintained through the use of various technical or legal devices. See, e.g., *Richmond Newspapers*, 488 U.S. at 580–81, and its progeny; see also *Sheppard v. Maxwell*, 384 U.S. 333, 358 (1966) (considering restrictions on access when prejudice or disadvantage might otherwise follow).

judicial proceedings generally.⁵ This approach would serve as a basis for demystifying the jury process while educating the public and increasing its confidence in the jury system. Furthermore, a right of access to jury deliberations might lessen the incentive for publicity-hungry media to harass and intimidate individual jurors. Finally, and over time, the publication of jury deliberations, and the accompanying scrutiny by the public, scholars, and bar, might produce better juries, resulting from a broad and *informed* solemnity for the jury process.⁶

This Comment argues that transcripts of jury deliberations, subject to the same balancing exercised by judges in the context of access to judicial proceedings, should be routinely accessible after trial. These transcripts could preserve juror anonymity through the use of codes or numbers to distinguish, but not personally identify, individual jurors. Further, and subject to the consent of the defendant and the jury, audio and visual records of jury deliberations should be permitted, subject to judicial discretion similar to that exercised in the context of televisions in the courtrooms.⁷ Additional mechanisms are proposed to mitigate concerns that these recordings would skew the composition of the jury. At no point does this Comment argue that transcripts or audiovisual records should be subject to judicial review, form the basis for appellate litigation, or disturb the common law and statutory prohibitions on the impeachment of jury

5. A limited right of access in this context

may be overcome only by an overriding interest based on findings that [post-trial] closure [of that record] is essential to preserve higher values and is narrowly tailored to serve that interest. The interest is to be articulated long with findings specific enough that a reviewing court can determine whether the closure order was properly entered.

Press-Enter. Co. v. Superior Court (Press Enter I), 464 U.S. 501, 510 (1984). In the context of access to the transcript of jury deliberations, a general and unarticulated reference to “jury privacy” would not alone suffice to justify presumptive closure of the jury record.

6. See generally Nancy S. Marder, *Deliberations and Disclosures: A Study of Post-Verdict Interviews of Jurors*, 82 IOWA L. REV. 465, 498–501 (1997) (suggesting that access might increase accountability and cause juries to take their work more seriously); Kenneth B. Nunn, *When Juries Meet the Press: Rethinking the Jury’s Representative Function in Highly Publicized Cases*, 22 HASTINGS CONST. L.Q. 405, 434 (1995) (arguing in the context of the “Jury’s New Representative Function,” that “[t]he more public the workings of a jury are, the more likely the community will be to fulfill its role as an arbiter of disputes and accept jury conclusions.”). But see *infra* note 41 and accompanying text.

7. The right of access does not attach to recording devices in courtrooms—required access involves merely allowing media to be present during trial proceedings and to inspect court documents related to those proceedings. See *Nixon v. Warner Comm., Inc.*, 435 U.S. 589, 610 (1978), where the Court stated:

Nor does the Sixth Amendment require that the trial—or any part of it—be broadcast live or on tape to the public. The requirement of a public trial is satisfied by the opportunity of members of the public and the press to attend the trial and to report what they have observed.

verdicts.⁸

Part I of the Comment explores the constitutional provisions relevant to access to jury deliberations. Part II outlines the common law traditions regarding access to jury deliberations, specifically impeachment of jury verdicts and the protection of jury privacy. Part III explores the dangers associated with access to jury deliberations, concluding that such concerns are ultimately unpersuasive in the postverdict setting, and in light of already existing practices that compromise the privacy of the jury. In either case, the concern for jury privacy should otherwise be subordinated to the public benefits from a limited right of access. Part IV suggests a framework for limited access to jury deliberations that satisfies most of the historical concerns for jury privacy and concludes with an argument that limited access to jury deliberations might result in an increased and informed solemnity for the function of the jury. A Postscript addresses the particular case of audiovisual recording devices in the jury room.

I. THE CONSTITUTION AND ACCESS TO JURY DELIBERATIONS

Nothing in the Constitution prohibits the recording of jury deliberations.⁹ Nevertheless, any positive theory of access to jury deliberations must be grounded in that text in order to mitigate the ongoing and inevitable legislative attempts to bar such access.¹⁰ Additionally, such a

8. This position contrasts with other arguments for access posed previously, which suggest that judicial, preverdict inquiry should be encouraged and permitted in order to ensure that juries are performing their duties consistent with their commitments. *See, e.g.*, Alison Markovitz, Note, *Jury Secrecy During Deliberations*, 110 YALE L.J. 1493, 1495, 1502 (2001) (arguing for a balance between “jury secrecy” and “judicial inquiry” in the preverdict context, which errs toward more inquiry in order to permit impartial inquiry into ongoing jury deliberations). *But see* United States v. Thomas, 116 F.3d 606, 623 (2d Cir. 1997):

[W]e are compelled to err in favor of the lesser of two evils—protecting the secrecy of jury deliberations at the expense of possibly allowing irresponsible juror activity. Achieving a more perfect system for monitoring the conduct of jurors in the intense environment of a jury deliberation room entails an unacceptable breach of the secrecy that is essential to the work of juries in the American system of justice. To open the door to the deliberation room any more widely and provide opportunities for broad-ranging judicial inquisitions into the thought processes of jurors would, in our view, destroy the jury system itself.

Case law and conventional wisdom, which insist that juries follow instructions, would seem to support a vision that the integrity of the jury is challenged more by preverdict judicial inquiry than by postverdict public access; particularly upon the assumption that finality of the verdict cannot be challenged. In any event, the competing interests at stake in the preverdict and postverdict settings are sufficiently distinct as to preclude analogy.

9. The realities of the modern context advise that the trend of the federal—if not state—courts is away from access in the context of judicial proceedings. Nevertheless, the absence of constitutional text bearing on the question of restricting access—versus affirmative access, however limited—is evidence that the question remains open and vital.

10. TEX. CODE CRIM. PROC. ANN. arts. 36.215 and 36.22 (Vernon 1981) (prohibiting

theory of access must account for constitutional provisions, which, in the context of access to jury deliberations, might be used to affirmatively bar or severely limit such access. Once a limited right of access attaches, similar findings and devices, balanced against the right of access in order to justify closure of courtroom proceedings,¹¹ can be implemented to mitigate any constitutional privacy or fair-trial implications that arise in the context of access to jury deliberations.

A qualified right of access attaches to judicial proceedings through the First and Sixth Amendments. The Court in *Richmond Newspapers* found that “the right to attend . . . trials is implicit in the guarantees of the First Amendment; without the freedom to attend such trials, . . . important aspects of freedom of speech and ‘of the press could be eviscerated.’”¹² The Court also found that in the absence of identifiable prejudice to the defendant this right of access trumped the defendant’s right to a fair trial as protected by the Sixth Amendment.¹³ Further, the defendant’s right to a public trial did not include the negative right to a private trial.¹⁴ Finally, the Court recognized that in the modern era, the public receives most of their information from the media, which acts as a proxy for the public.¹⁵

In order to determine whether a right of access attached to judicial proceedings, the Court looked to both logic, the “community therapeutic value” of openness, and experience—whether the trial proceedings in question had historically been opened to the public.¹⁶ However, implicit in the Court’s opinion are two concerns: (1) the media *increasingly* functions

any recording of jury deliberations, and provides that “[n]o person shall be permitted to be with a jury while it is deliberating”). See also Fed. R. Evid. 606(b) (codifying the impeachment doctrine).

11. When “a qualified First Amendment right of access attaches . . . the proceedings cannot be closed unless specific, on-the-record findings are made demonstrating that ‘closure is essential to preserve higher values and is narrowly tailored to serve that interest.’” *Press Enter II*, 478 U.S. at 13–14 (quoting *Press Enter I*, 464 U.S. at 510). In *Richmond Newspapers*, the Court asserted that lower courts must: (1) make specific and on-the-record findings; (2) investigate less restrictive alternatives to closure; and, (3) identify the constitutional right of access and balance the findings against that right. 488 U.S. at 580–81 (“[T]he trial judge made no findings to support closure; no inquiry was made as to whether alternative solutions would have met the need to ensure fairness; there was no recognition of any right under the Constitution for the public or press to attend the trial.”).

12. 448 U.S. at 580 (quoting *Branzburg v. Hayes*, 408 U.S. 665, 681 (1972)). The Court found that this guarantee encompassed each of the specific rights to speech, press and assembly. *Id.* at 575–78.

13. *Id.* at 580–81.

14. *Id.* at 580.

15. *Id.* at 577 n.12; see also *Nixon*, 435 U.S. at 609 (“Since the press serves as the information-gathering agent of the public, it [can] not be prevented from reporting what it ha[s] learned and what the public [i]s entitled to know.”). But see *Saxbe v. Washington Post Co.*, 417 U.S. 843, 850 (1974); *Pell v. Procunier*, 417 U.S. 817, 834–835 (1974).

16. 448 U.S. at 570.

as a proxy for the public and as a check on and observer of government, specifically judicial proceedings; and (2) because of the nature of modern society, where individuals have neither the time nor the proximity to courthouses in order to participate, a more fundamental right of access was needed in order to accommodate and facilitate scrutiny of judicial proceedings.

In this way, *Richmond Newspapers* seems to assert that, in consideration of the public's alienation from the trial experience, a right of access must now attach as an indispensable element of an "informed" democracy, necessary to the "enjoyment of [those constitutional] rights explicitly defined."¹⁷ Viewed in the context of subsequent case law,¹⁸ focusing more specifically on the logic prong, *Richmond Newspapers* can be viewed as a fundamental decision that unlocked the door and grounded the right of access as an indispensable element of modern democracy, a "categorical assurance of the . . . freedom of access to information" in the judicial setting.¹⁹ And the parameters of this right of access must shift with other developments in modern life. Indeed, just as technology will open new and less intrusive avenues to access, the Supreme Court has explicitly recognized that the doctrine of access will similarly accompany such changes.²⁰ In this sense, the right of access will come to play "a structural role . . . in securing and fostering our republican system of self-government."²¹ And this right of access, to gather information, will not be

17. *Id.* at 580.

18. *See, e.g.*, *Globe Newspapers Co. v. Superior Court*, 457 U.S. 596 (1982) (right of access attaches to testimony of rape-victim minors, even though historically closed); *Press Enter II*, 478 U.S. at 9 (right of access attaches to preliminary proceedings in California, even though historically closed); *In re Krynicki*, 983 F.2d 74, 75 (7th Cir. 1992) (resolving persistent claims to secrecy within the appellate process); *United States v. Chagra*, 701 F.2d 354, 363 (5th Cir.1983) ("[T]he lack of an historic tradition . . . does not bar . . . a right of access."). *See also* Cerutti, *supra* note 2, at 280 (highlighting the structural prong of *Richmond Newspapers* and asserting that this prong has been "significantly extended by the lower courts").

19. 448 U.S. at 585 (Brennan, J., concurring). The primacy of this structural analysis is evident in the majority's citation to Jeremy Bentham:

Without publicity, all other checks are insufficient: in comparison of publicity, all other checks are of small account. Recordation, appeal, whatever other institutions might present themselves in the character of checks, would be found to operate rather as cloaks than checks; as cloaks in reality, as checks only in appearance.

Id. at 569 (quoting 1 J. Bentham, *Rationale of Judicial Evidence* 524 (1827)).

20. "When the advances in these arts permit reporting . . . by television without [its] present hazards to a fair trial we will have another case." *Estes v. Texas*, 381 U.S. 532, 540 (1965). *See also* *Chandler v. Florida*, 449 U.S. 560 (1981) (overruling *Estes* in everything but name).

21. *Richmond Newspapers*, 448 U.S. at 587 (Brennan, J., concurring) (citations omitted). Indeed, the majority was explicit in this regard:

Looking back, we see that when the ancient "town meeting" form of trial became

subordinated to the rights or interests of the parties or of the courts except on particularized findings that prejudice will inhere.

Constitutional provisions that might insulate or bear on the roles of jurors and jury are not sufficient to trump the right of access to gather information. A constitutional right of privacy does not attach to the deliberations of the jury, nor does such a right attach for the individual. Indeed, absent articulable findings as to possible danger to jury safety, juror identity is part of the public record generated during trial proceedings.²² Such concerns for privacy are generally satisfied through enforcement of common law protections of jury secrecy. Alternately, the First Amendment affords almost complete protection for postverdict speech by individual jurors.²³ Indeed, the increase and profile of postverdict interviews in the media today is some evidence both that juror secrecy is no longer sacrosanct in our culture and that limited access to jury deliberations is both desirable and necessary to an informed democracy, albeit one where the distinction between entertainment and news has been significantly eroded.²⁴

Finally, any right of access to jury deliberations, as protected by the Fifth and Sixth Amendments, might impair the defendant's right to a fair trial—specifically as fairness is implicated by jury privacy in deliberations. As Justice Cardozo opined, "For the origin of the privilege we are referred to ancient usage, and for its defense to public policy. Freedom of debate

too cumbersome, 12 members of the community were delegated to act as its surrogates, but the community did not surrender its right to observe the conduct of trials. The people retained a "right of visitation" which enabled them to satisfy themselves that justice was in fact being done. People in an open society do not demand infallibility from their institutions, but it is difficult for them to accept what they are prohibited from observing. When a criminal trial is conducted in the open, there is at least an opportunity both for understanding the system in general and its workings in a particular case

Id. at 572. *Cf.* Cerutti, *supra* note 2.

22. In *re* Baltimore Sun Co., 841 F.2d 74, 76 (4th Cir. 1988) the court stated:

We recognize the difficulties which may exist in highly publicized trials such as the case being tried here and the pressures upon jurors. But we think the risk of loss of confidence of the public in the judicial process is too great to permit a criminal defendant to be tried by a jury whose members may maintain anonymity. If the district court thinks that the attendant dangers of a highly publicized trial are too great, it may always sequester the jury; and change of venue is always possible as a method of obviating pressure or prejudice.

See also United States v. Barnes, 604 F.2d 121 (2d Cir. 1979) (realistic threats to juror safety or jury corruption were compelling reasons sufficient to warrant protection of juror identity).

23. *But see* In *re* Express-News Corp., 695 F.2d 807, 811 (5th Cir. 1982) (stating in dicta that jurors could be prohibited from disclosing individual votes of other jurors).

24. *See* Markovitz, *supra* note 8, at 1514 ("[T]he extensive postverdict disclosure of jury deliberations makes it likely that jurors *already* enter deliberations with the understanding that their discussion may become public at some point.") (emphasis added).

might be stifled and independence of thought checked if jurors were made to feel that their arguments and ballots were to be freely published to the world."²⁵ The argument follows that, if jurors were aware in advance of the verdict that their deliberations were to be disseminated to the public, their ability to remain free of influence (neighbors, parties, media) and to deliberate freely would be affected, possibly affecting defendant's right to a fair trial. Given that the right to a fair trial is owned by a defendant, and post-verdict release of jury transcripts might be said to impair that right, a "knowing and intelligent" waiver by the defendant could cure this concern.²⁶

Nevertheless, the suggestion that postverdict release of jury deliberations might have more affect than media presence and reporting during the trial and after the verdict is not persuasive.²⁷ Indeed, arguments against postverdict access to jury deliberations are purely speculative,²⁸ and sound ominously familiar to the "parade of horrors" hypothesized in the wake of the early placement of televisions in courtrooms.²⁹ Empirical data confirming that juries will be chilled by postverdict access to their deliberations is neither available nor logically sustainable given both the informal access already generated through interviews and the relative ambivalence to televisions in the courtrooms.

Further, once the jury's work is complete, who "owns" the trial proceedings and the jury verdict? If we are to take the right of access and

25. *Clark v. United States*, 289 U.S. 1, 13 (1933).

26. See *Johnson v. Zerbst*, 304 U.S. 458, 464 (1938); *United States v. Brady*, 397 U.S. 742, 748 (1970); cf. *Iowa v. Tovar*, 541 U.S. 77 (2004).

27. A more thorough exploration of this issue will have to await publication of empirical studies. For the purposes of this Comment, I argue that specific parameters for postverdict release—juror anonymity, sufficient time lapse between verdict and release—satisfy those concerns for privacy that might otherwise interfere or balance against a constitutional right of access necessary for an informed democracy.

28. See Abraham Goldstein, *Jury Secrecy and the Media: The Problem of Postverdict Interviews*, 1993 U. ILL. L. REV. 295, 307–08, 314 (1993) (arguing without support that "the defendant's right to a fair trial—by a jury confident that its deliberations will remain secret—is seriously threatened when jurors expect that they will have to face the media, or that their fellow jurors will talk to the media." Further, the expectation of such access "will affect how freely [the jurors] talk to each other; it will make them feel visible to the world and accountable as individuals, not as a body."). In the words of the same author, "these are the grossest of speculations." *Id.* at 313. Indeed, the parameters here proposed on access might mitigate the inevitable effects already present from current forms of access—dissemination of transcripts with anonymous identities may actually increase our understanding of the jury as a "body," and not a rag-tag gathering of "individuals."

29. See *Estes*, 381 U.S. at 546, where the Court stated:

It is the awareness of the fact of telecasting that is felt by the juror throughout the trial. We are self-conscious and uneasy when being televised. Human nature being what it is, not only will the juror's eyes be fixed on the camera, but also his mind will be preoccupied with the telecasting rather than with the testimony.

its intended use to foster and sustain an informed democracy, then “[a] trial is a public event. What transpires in the court room [and in the jury room] is public property.”³⁰ By analogy, and recognizing the need for jury privacy *during deliberations*, a right of access that attaches *after the release of a verdict*, is consistent both with tradition and with the need to know what attaches to any governmental or judicial process. Indeed, “[h]istory ha[s] proven that secret tribunals [are] effective instruments of oppression.”³¹

In the context of media access to judicial proceedings, resolution depends upon a balance between speech, societal interest in the proceedings, increasing public confidence in the judicial process, and a defendant’s right to a fair trial. While the defendant’s right to a fair trial is arguably implicated by postverdict access to jury deliberations, in the absence of particularized findings and mindful of special parameters for release of this information, such a right should be subordinated to the postverdict right of access to jury deliberations.

II. THE JURY AND THE COMMON LAW

Critical to identifying a postverdict right of access to jury deliberations while maintaining allegiance to the common law traditions of jury secrecy is the unrecognized and central distinction between contemporaneous access to jury deliberations and subsequent access to a jury verdict, owned by the public as an expression and representation of our system of justice. The model of access proposed here in no way subverts or challenges the common law traditions of jury privacy that have thus far served as an almost impenetrable barrier to disturbing the finality of the verdict itself. Indeed, the structural model of access above identifies the public as the political body to scrutinize the work of juries, and neither allows for even limited judicial review of these transcripts for the purposes of inquiring into jury deliberations, nor provides a means by which to challenge those verdicts (either post-trial or on appeal).³²

Federal Rule of Evidence 606(b) codified the long-standing common law proposition that jurors may not impeach their own verdict.³³ Rule

30. *Craig v. Harney*, 331 U.S. 367, 374 (1947).

31. *Estes*, 381 U.S. at 539.

32. *But see* Ruprecht, *supra* note 2 (arguing that limited judicial review—not public access—should flow as the appropriate “check” on jury deliberations). If any limited judicial review should attach, the appropriate context would be the penalty phase of a death penalty case, where the jury is asked to “weigh” aggravating and mitigating circumstances in order to determine whether the defendant is death-eligible. The danger for misconduct or extraneous influence in this context is extreme and might warrant inquiry sufficient to determine whether the jury behaved irresponsibly.

33. *See, e.g.*, 8 J. Wigmore, EVIDENCE § 2352, pp. 696–97 (J. McNaughton rev. ed. 1961) (1904) (explaining that the rule originated from an opinion by Lord Mansfield in 1785

606(b) provides that a juror may not testify on the subject of deliberations to impeach the finality of the verdict, "except that a juror may testify on the question whether extraneous prejudicial information was improperly brought to the jury's attention or whether any outside influence was improperly brought to bear upon any juror."³⁴ The most recent interpretation of this doctrine came in *Tanner v. United States*,³⁵ where the Court refused to inquire into jury deliberations despite evidence that the jurors had been doing drugs and drinking alcohol throughout the trial and during deliberations.³⁶ Notwithstanding the reasonableness of this decision, the Court's concern focused on "the finality of the process,"³⁷ and the safety of the verdict as it related to the continued vitality of the jury system as a means to administer justice.³⁸ The Court's concern with juror privacy in this context represents a policy choice between "redressing the injury of the private litigant and inflicting the public injury which would result if

and "came to receive in the United States an adherence almost unquestioned.")

34. FED. R. EVID. 606(b).

35. 483 U.S. 107 (1987).

36. In terms of evaluating whether a verdict should be scrutinized, the Court fashioned from prior case law a sharp distinction between external and internal influences. See generally *Mattox v. United States*, 146 U.S. 140, 149 (1896) ("a juror may testify to any facts bearing upon the question of the existence of any extraneous influence, although not as to how far that influence operated upon his mind.") (quoting *Woodward v. Leavitt*, 107 Mass. 453, 466 (1871)).

37. See *Tanner*, 483 U.S. at 120.

38. *Id.* ("There is little doubt that postverdict investigation into juror misconduct would in some instances lead to the invalidation of verdicts reached after irresponsible or improper juror behavior. It is not at all clear, however, that the jury system could survive such efforts to perfect it."). Similarly, the court in *United States v. Thomas*, 116 F.3d 606, 619 (2d Cir. 1997) stated:

The jury system incorporated in our Constitution by the Framers was not intended to satisfy yearnings for perfect knowledge of how a verdict is reached, nor to provide assurances to the public of the primacy of logic in human affairs. Nor was it subordinated to a "right to know" found in the First Amendment. The jury as we know it is *supposed* to reach its decisions in the mystery and security of secrecy; objections to the secrecy of jury deliberations are nothing less than objections to the jury system itself.

(emphasis in original). *But see Tanner*, 483 U.S. at 142 (Marshall, J., dissenting) (quoting the opinion of the Court):

The Court acknowledges that "postverdict investigation into juror misconduct would in some instances lead to the invalidation of verdicts reached after irresponsible or improper jury behavior," but maintains that "[i]t is not at all clear . . . that the jury system could survive such efforts to perfect it." Petitioners are not asking for a perfect jury. They are seeking to determine whether the jury that heard their case behaved in a manner consonant with the minimum requirements of the Sixth Amendment. If we deny them this opportunity, the jury system may survive, but the constitutional guarantee on which it is based will become meaningless.

(citations omitted).

jurors were permitted to testify as to what happened in the jury room.”³⁹

Concern for the ability of the jury to function in this context is inextricably linked to judicial intervention (at trial or on appeal) and not with public scrutiny of verdicts themselves, which will continue unabated even without a postverdict right of access.⁴⁰ This concern for the finality of verdicts is not compromised by postverdict public access to jury deliberations—where scrutiny will not lead to trial challenges or post-trial litigation. On the contrary, knowledge that a limited right of access attaches—with the accompanying public scrutiny—might enhance both jurors’ seriousness and commitment to service as well as the public’s commitment to the central and solemn function of the jury in our system of justice.

In addition to the common law doctrine restricting juror impeachment, the courts have long recognized a freestanding commitment to jury secrecy during the deliberative process. This tradition has been incorporated in both statutes and judicial canons restricting the presence of individuals (nonjurors or alternates) and recording devices in the jury room.⁴¹ In addition, the commitment to jury secrecy is reflected in judicial pronouncements founded upon broad policy concerns: (1) the need to assure full and frank discussion in the jury room,⁴² (2) to prevent harassment of or retaliation against jurors from both losing parties and

39. *McDonald v. Pless*, 238 U.S. 264, 267 (1915). The Court stated:

[L]et it once be established that verdicts solemnly made and publicly returned into court can be attacked and set aside on the testimony of those who took part in their publication and all verdicts could be, and many would be, followed by an inquiry in the hope of discovering something which might invalidate the finding.

Id. However, in *Clark*, the Court stated:

Assuming that there is a privilege which protects from impertinent exposure the arguments and ballots of a juror while considering his verdict, we think the privilege does not apply where the relation giving birth to it has been fraudulently begun or fraudulently continued. Other exceptions may have to be made in other situations not brought before us now.

289 U.S. at 13–14.

40. *Tanner*, 483 U.S. at 124 (citing S. Rep. No. 93-1277, at 13–14 (1974), which asserted that “[j]urors will not be able to function effectively if their deliberations are to be scrutinized in post-trial litigation.”).

41. FED. R. CRIM. P. 24(c) provides that alternate jurors are to be excused at the commencement of deliberation. However, the Supreme Court in *United States v. Olano*, 507 U.S. 725, 737 (1993), held that deviation from this provision, and allowing jurors to sit in the jury room without deliberating, did not affect the substantial rights of the defendant. *See also McDonald*, 238 U.S. at 268 (recognizing that while limiting access to the jury room may “exclude the only possible evidence of misconduct, a change in the rule would open the door to the most pernicious arts and tampering with jurors. The practice would be replete with dangerous consequences. It would lead to the grossest fraud and abuse and no verdict would be safe.”) (citations omitted).

42. *Clark*, 289 U.S. at 13.

other aggrieved members of the public,⁴³ and (3) to preserve the community's trust in a system that relies on juries to mete out justice.⁴⁴

Again, the concern that jury speech will be chilled flows from the influence that a recording device or alternate presence might have had, and not on the effect created by the knowledge of limited access (anonymously configured) to jury deliberations. In this sense, "the primary if not exclusive purpose of jury privacy and secrecy is to protect the jury's deliberations from improper influence."⁴⁵ Whether postverdict dissemination of a jury transcript (anonymously configured) will have prejudicial impact is questionable; whether that concern is as weighty as the public's right to know is doubtful. Furthermore, this calculus must also include the likelihood that postverdict public scrutiny will actually improve the content of jury deliberations through increased public knowledge and respect for the jury process.

The concerns that individual jurors might be harassed are not distinct or persuasive in this context. Indeed, "generalized social claims should not bear upon a decision whether limitations should be placed upon the press's ability to have post-trial access to jurors."⁴⁶ As to aggrieved parties, trial courts have limited power to curtail the speech of judicial officers.⁴⁷ Further, trial courts cannot silence requests to individual jurors for postverdict interviews.⁴⁸ Harassment from aggrieved members of the public can be minimized through release of transcripts that do not identify jurors by name. In particularly high profile or other special cases, and subject to the balancing test for closure of judicial proceedings generally, the right of access may be subordinated to absolute juror privacy. Given that juror anonymity itself is only rarely upheld, such instances of closure will be

43. If privacy did not inhere, "[j]urors would be harassed and beset by the defeated party in an effort to secure from them evidence of facts which might establish misconduct." *McDonald*, 238 U.S. at 267.

44. See Part I, *supra*.

45. *Olano*, 507 U.S. at 737-38. In this sense the Court's scrutiny is focused on "prejudicial impact." *Id.* at 738. Cf. *Johnson v. Duckworth*, 650 F.2d 122, 124 (7th Cir. 1981) (because "the privacy of jury deliberations is so essential to the 'substance of the jury trial guarantee[...]' . . . when strangers are permitted to intrude upon such privacy, an error of constitutional dimension is committed.") (quoting *Burch v. Louisiana*, 441 U.S. 130, 138 (1979)).

46. *United States v. Antar*, 38 F.3d 1348, 1363 (3rd Cir. 1994).

47. See generally *Gentile v. State Bar*, 501 U.S. 1030 (1991) ("[D]isciplinary rules governing the legal profession cannot punish activity protected by the First Amendment."); *Nebraska Press Ass'n v. Stuart*, 427 U.S. 539 (1976) (arguing that any prior restraint on speech in the context of a criminal trial bears a "heavy burden" of justification).

48. See, e.g., *Antar*, 38 F.3d at 1363 (stating that the right of access attaches and "[t]he court must articulate findings of the actual expectation of an unwarranted intrusion upon juror deliberations or of a probability of harassment of jurors beyond what the jurors, rather than what a particular judge, may deem to be acceptable.").

similarly rare. Indeed, the fact that juror anonymity is so rarely imposed and upheld is evidence both of the importance of the right of access, and that arguments for juror privacy are unavailing—the system is not designed to provide postverdict privacy.⁴⁹

The concern for the jurors' privacy has historically been confined to the deliberative process. Access to information after that process is complete implicates that concern for privacy only to the extent that this postverdict access might influence the deliberative process. As noted previously, because this concern is both unsubstantiated and highly speculative, it should give way to the public's right to know. In other words, society owns the verdict after it has been rendered. The verdict is a proxy for justice, and the public has a right to know whether and how justice was done in the individual case.

III. NO DANGER: ABSOLUTE JURY PRIVACY IS A RELIC

The primary danger of a postverdict right of access to jury deliberations is that the transcript might become a vehicle for disturbing jury verdicts or appellate litigation. In this sense, right of access would become a threat "to the jury system itself."⁵⁰ This slippery slope argument posits that any inquiry into jury deliberations will inevitably lead to judicial review of those jury deliberations and destabilize the entire foundation of the jury system.⁵¹ Unarticulated, but implicit in this formulation, is that any scrutiny of jury deliberations is likely to uncover widespread misconduct and incompetence. Whether such fear is warranted is debatable, but the

49. See *ABC, Inc. v. Stewart*, 360 F.3d 90 (2nd Cir. 2004) (attaching right of access to voir dire proceedings; subjecting closure to strict scrutiny; publishing the transcript later is irrelevant). This approach is consistent with an historical examination of juror privacy in the context of early American society—where neighbors in relatively confined communities were keenly aware of who was serving on the jury. See, e.g., David Weinstein, *Protecting a Juror's Right to Privacy: Constitutional Constraints and Policy Options*, 70 TEMP. L. REV. 1, 30 (1997) ("Jurors in the early days of this republic were selected from within small communities, and shielding their identity simply was not possible."); see also *infra* note 52 and accompanying text.

50. *United States v. Thomas*, 116 F.3d 606, 619 (2nd Cir. 1997).

51. See generally Goldstein, *supra*, note 28, at 313–14 ("If we let the genie out of the bottle, we probably will be unable to put it back again."). Goldstein goes on to suggest that "[o]nce the inscrutability principle has gone, the time has come to set up another kind of tribunal." *Id.* at 314 (quoting William R. Cornish, *THE JURY* 258 (1968)). See also Abraham Abramovsky & Jonathan I. Edelman, *Cameras in the Jury Room: An Unnecessary and Dangerous Precedent*, 28 ARIZ. ST. L.J. 865, 881 (1996) ("[T]aped deliberations may indeed reveal jury misconduct or discussion of extraneous factors, but they also open the door to a stream of potential litigation. . . ."). But see Ruprecht, *supra* note 2 (arguing that limited judicial review should follow from a right of access to jury deliberations, thus improving our determination of error in the courtroom and the public confidence in the system thereby).

proposition that we should avoid excavation, because we are likely to dig up evidence that calls into question our current method for administering justice, is unsupportable as a matter of democratic principle. If the effect is to undermine public confidence in the jury, that effect should be welcomed. We might then begin to consider and institute a remedy for this erosion of confidence, if such a remedy is not self-generating through the process of transparency itself.

A reflexive citation to the ancient common law tradition of jury secrecy is also an insufficient response. Any discussion of postverdict access to jury deliberations must acknowledge both the changing nature of privacy,⁵² the diffuseness of modern American society, as well as an increasing alienation and mistrust of the jury process. In this sense, an unexplored and rigid adherence to jury secrecy fails to even address whether such access might, in fact, increase accountability and trust for our judicial institutions.

The rationale for this historical preservation of juror secrecy is that any contemporaneous access to jury deliberations might affect free debate within the jury room, thus distorting the process and jeopardizing the fair administration of justice. Of course, this blanket prohibition is completely anathematic to our approach to accessing governmental, particularly judicial, deliberations generally, where case by case scrutiny (adjudication) is undertaken to determine whether those *particular* proceedings need to be closed. Furthermore, there is only a "*generalized social claim*"⁵³ of prejudicial effect to justify frustrating access. This is an empty and untested hypothesis on balance, and in the absence of empirical evidence, this claim must be subordinated to the public right of access.

The final rationale for jury secrecy is that the release of jury deliberation will compromise juror safety. As an initial matter, juror anonymity is provided for only in cases where a real threat has been identified.⁵⁴ Furthermore, absent identifiable, special circumstances which

52. It also seems clear that the public enjoyed a level of access to juries at early American common law unheard of to contemporary society. Jurors then were actually neighbors, local figures, etc. who were well known to each other. Indeed, jury lists were presumptively available—consistent with the relative size of those communities and the free flow of information within those communities regarding judicial proceedings. *See, e.g.*, In re Baltimore Sun Co., 841 F.2d 74, 75 (4th Cir. 1988) ("When the jury system grew up with juries of the vicinage, everybody knew everybody on the jury . . .").

53. *See Antar*, 38 F.3d at 1363.

54. *See, e.g.*, *United States v. Fernandez*, 388 F.3d 1199 (9th Cir. 2004) (upholding the empanelling of an anonymous jury for a Mexican mafia RICO case); *United States v. Brown*, 250 F.3d 907 (5th Cir. 1991) (upholding district court's decision to empanel anonymous jury and to prohibit media access to information after the verdict had been rendered); *United States v. 77 E. 3rd St.*, 849 F. Supp. 876, 878–80 (S.D.N.Y. 1994) ("History of violence" warranted empanelling anonymous jury in civil forfeiture case to

would change the entire calculus, a postverdict right of access to anonymously configured jury deliberations would, standing alone, appear to be less likely to compromise juror safety than pretrial publication of jurors' identities.⁵⁵

Again, nothing in this theory of access precludes the balancing test already employed with regard to closure of trial proceedings or empanelling of anonymous juries. Postverdict access to jury deliberations would be presumed, but upon specific findings that such access compromised juror safety or the right of the defendant to a fair trial, access could be denied. As with the other dangers identified above, juror safety is already implicated in the right of access to trial proceedings, and extending that right of access to include postverdict release of transcripts of jury deliberations (anonymously configured) does not inherently increase the risks identified.

Current invasions into jury secrecy clearly subvert many of the claims made by opponents of a postverdict right of access to jury deliberations.⁵⁶ Indeed, many proponents of jury secrecy have already identified these intrusions as an irreparable affront to the common law tradition.⁵⁷ As noted above, the narrowly tailored limitations on anonymous juries are one indication that our concern for juror privacy must be balanced against a right of access. In addition, the incidence of postverdict interviews already provides an opportunity to scrutinize the content of jury deliberations. Furthermore, if a record existed and was publicly available, the media would have less incentive to interview or harass jurors, and the financial incentive for jurors to engage in postverdict interviews would be mooted.⁵⁸

protect jurors from retaliation by Hell's Angels). These cases make clear that empanelling anonymous juries is contingent on identifiable risk to juror safety—based on threats, conduct of the defendant, or history of intimidation.

55. That the media will pore over these transcripts and be able to identify and distinguish individual jurors would be nothing new—postverdict interviews with jurors already facilitate such scrutiny. In addition, this concern is only present in high-profile cases where special circumstances might weigh toward jury anonymity. More traditional media and scholars seeking to demystify and understand the jury process will utilize transcripts from lower profile cases. In this way, by force of repetition and scholarship, the jury process will become both demystified and more mundane, but still accountable, and less subject to publicity. Indeed, the majority of the records that would be synthesized and reported on have little else but scholarly, judicial, and historical value.

56. Not taken up here, but also relevant to inroads into absolute jury secrecy, is the increasing discretionary practice of allowing individual jurors to ask questions via the trial court judge of the various witnesses. *See, e.g.*, IND. JURY R. 20(7) (stating that jurors may seek to ask questions of witnesses by submitting those questions in writing). *See also* State v. Fisher, 789 N.E.2d 222 (Ohio 2003) (on the propriety of juror questions); Commonwealth v. Britto, 744 N.E.2d 1089 (Mass. 2001) (discussing the propriety of juror questions).

57. *See generally* Abramovsky & Edelstein, *supra* note 51; Goldstein, *supra* note 28.

58. I do not mean to suggest that a limited right of access would completely moot the

Ultimately, the prevalence of postverdict interviews itself suggests: (1) a weakening public concern for juror privacy, (2) a correlative increase in public interest in jury deliberations, and (3) a need for access to jury deliberations to increase public confidence in the institution and for the "community therapeutic value" that flows from the gathering and dissemination of information.

IV. PARAMETERS FOR A POSTVERDICT RIGHT OF ACCESS TO JURY DELIBERATIONS

Once the right of access attaches, parameters for release of a transcript of jury deliberations can be tailored to address realistic concerns for juror privacy. As an initial matter, *postverdict* release coupled with an absolute prohibition against use of transcripts for litigation purposes⁵⁹ address most of the historical and policy concerns for juror secrecy. Primarily, juror secrecy was intended for the actual process by which juries reach their verdict.⁶⁰ This concern is evident in common law doctrine prohibiting jurors from impeaching their own verdict.⁶¹ *Postverdict* release insures that juror safety, which is already implicated by the right of access to jury lists, is not *further* compromised. Protestations that speech will nevertheless be chilled are a general societal claim lacking an evidentiary foundation. The implied *postverdict* right of access that inhered in early American society⁶² casts further doubt on the legitimacy of this claim.⁶³

Secondly, transcripts of jury deliberations can be configured without identifying individual jurors by name, thus serving as an additional safeguard against potential *postverdict* harassment or retaliation. This parameter is also consistent with the Fifth Circuit's dictum that prohibiting

desire or hysteria concerning *postverdict* interviews with jurors, more than the form of such access would mitigate and counterbalance the hysterical access characterized currently by the sensationalism of *postverdict* interviews. Indeed, the prevalence of such interviews reinforces the point made above: jury privacy is no longer sacrosanct. Further, and more importantly, creating a limited right of access, while not stemming the hysteria, would offer a countervailing and more solemn and academic approach to assessing jury performance. This argument then flows back into my secondary thesis: that access in this format may have the result of increasing respect for and understanding of the jury process.

59. Prohibiting the use of transcripts for posttrial litigation or verdict inquiry also works to preserve the common law doctrine against the impeachment of jury verdicts. If an absolute prohibition against such use of jury transcripts was instituted, no concern regarding possible impeachment is availing.

60. See Goldstein, *supra* note 28, at 299–300 n.19 (discussing the critical "relationship between secrecy and finality").

61. See, e.g., *Vaise v. Delaval*, 99 Eng. Rep. 944 (K.B. 1785) (opinion by Lord Mansfield) (refusing to accept into evidence the affidavits of jurors to show they had arrived at their verdict by lot); see Wigmore, *supra*, note 33.

62. See Weinstein, *supra* note 49 and accompanying text.

63. See *supra* note 52 and accompanying text.

disclosure of “the ballots of individual jurors” is a “paramount value.”⁶⁴ Again, the limited right of access should not be viewed as an extension or further invasion of jury secrecy. These invasions already occur, albeit in a less vital and more perverse way. In this sense, a postverdict right of access to jury deliberations might actually enhance the public debate on the jury process, providing a mechanism for informed and circumspect evaluation of that process.

Finally, the parameters that would justify postverdict closure of the jury transcript can be assessed on a case-by-case basis, subject to the same balancing used to assess access to judicial proceedings generally. Arguably the contexts in which such closure might be justified are more numerous with regard to jury privacy; case law development can address these circumstances. As elsewhere, “any privilege of access to governmental information is subject to a degree of restraint dictated by the nature of the information and countervailing interests in security or confidentiality.”⁶⁵ The attachment of the right of access means that the values that inhere in the structural model are observed—a respect for “th[ose] process[es] of communication necessary for a democracy to survive . . .”⁶⁶

Against the argument for absolute jury secrecy, with its attendant fear-mongering and blind adherence to dated mantras, lies a conception of access to jury deliberations as an “indispensable condition[] of meaningful communication” about the American justice system.⁶⁷ The increasing incidence of sensationalistic postverdict interviews with jurors, themselves uninformed and lacking meaning, has already unalterably pierced the veil of juror secrecy.⁶⁸ What is needed is reasonable access to these deliberations, not to *perfect* the jury system, but to generate and foster informed debate and serious reflection on that deliberative body. Contrary to opponents’ speculations, a right of access to jury deliberations, in text and anonymously configured, is more likely to lead, not down the slippery slope, but to “uninhibited, robust, and wide-open”⁶⁹ public dialogue regarding the jury process and, finally, a renewed sense of public commitment to the solemnity of jury duty.

64. In re Express-News Corp., 695 F.2d 807, 811 (5th Cir. 1982); cf. Goldstein, *supra* note 28, at 304.

65. *Richmond Newspapers*, 448 U.S. at 586 (Brennan, J., concurring).

66. *Id.* at 588.

67. *See id.*

68. *See, e.g.*, William R. Bagley, Jr., *Jury Room Secrecy: Has the Time Come to Unlock the Door?*, 32 SUFFOLK U. L. REV. 481, 500–01 (1999).

69. *N.Y. Times, Co. v. Sullivan*, 376 U.S. 254, 270 (1964).

V. POSTSCRIPT: CAMERAS IN THE JURY ROOM?

As with cameras in the courtroom, future developments in recording jury deliberations for postverdict dissemination should proceed subject to judicial discretion and the dual concerns for jury privacy and defendants' right to a fair trial. Justice Harlan's concurrence in *Estes v. Texas* is instructive: "[T]he day may come when television will have become so commonplace an affair in the daily life of the average person as to dissipate all reasonable likelihood that its use in courtrooms may disparage the judicial process."⁷⁰

Indeed, "[t]he law [] favors publicity in legal proceedings, so far as that object can be attained without injustice to the persons immediately concerned."⁷¹ In these developments, the lower and state courts should serve as laboratories—as long as the state action does not infringe upon constitutional guarantees, the states must be permitted to experiment.⁷²

Similarly, the common law of judicial discretion should govern these experiments. The trial judge, through grant of jurisdiction, is generally charged with the maintenance of order within her own courtroom. In this regard, the judge has both inherent power and broad discretion over control of judicial proceedings. For example, a judge may authorize presence of cameras in the courtroom over an objection by the defendant, unless the defendant makes a showing that the presence of those cameras will be prejudicial.⁷³ Similar discretion, mindful of a tradition of jury secrecy, would inhere in the discretion whether to record jury deliberations for future dissemination.

The following parameters for audiovisual recording of jury deliberations could mitigate the constitutional concern for defendants' fair-trial rights as well as the common law tradition providing for juror secrecy. First, defendants would need to waive objection to the recording,

70. 381 U.S. at 595 (Harlan, J., concurring). See also *supra* note 22 and accompanying text. Cf. *Chandler*, 449 U.S. at 575, where the Court stated:

The risk of juror prejudice is present in any publication of a trial, but the appropriate safeguard against such prejudice is the defendant's right to demonstrate that the media's coverage of his case . . . compromised the ability of the particular jury that heard the case to adjudicate fairly.

71. *Estes*, 381 U.S. at 542. (citation omitted).

72. See *New State Ice Co. v. Liebman*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting):

To stay experimentation in things social and economic is a grave responsibility. Denial of the right to experiment may be fraught with serious consequences to the Nation. It is one of the happy incidents of the federal system that a single courageous State may . . . serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.

Id.

73. See *Chandler*, 449 U.S. at 575.

precluding them from using the fact or product of recorded deliberations as a mechanism for challenging a verdict or for pursuing appeal.⁷⁴ Second, a jury would be empanelled without knowledge that their deliberations would be filmed. This protocol would insure that the jury composition would not be skewed toward only those willing to seek out publicity.⁷⁵

After empanelling the jury, each juror would be asked to approve the unobtrusive placement of cameras in order to record their deliberations. If a single juror objected at this point, then no recording devices would be permitted. Finally, and assuming unanimous agreement to audiovisual recording, each juror would retain a postverdict veto on release of the audiovisual record. Each of these safeguards works to confirm juror autonomy in the deliberative process.

74. This provision is premised on the notion, inherent in the right of access generally, that it is the defendant who owns the right to a fair trial. *Estes*, 381 U.S. at 588 (“[T]he right of ‘public trial’ is not one belonging to the public, but one belonging to the accused . . .”) (Harlan, J., concurring). See also *Gannet Co., Inc. v. DePasquale*, 443 U.S. 368, 387–388 (1979). While all parties have an interest in the fair administration of justice, only the defendant’s right should be able to trump the court’s exercise of judicial discretion to permit cameras in the jury room. *But see State ex rel. Rosenthal v. Poe*, 98 S.W.3d 194 (Tex. Crim App. 2003) (prohibiting cameras in the jury room despite waiver by the defendant of use of recording and agreement by all jurors to be taped).

75. Administrative Order, Docket No. SJC-228, 1996 Me. LEXIS 32 at *5 (Fed. 5, 1996) (Glassman & Ridnman, JJ., statement in nonconcurrence) (“Selection of only those jurors who do not mind thinking out loud before millions of observers, or those who will serve but in silence, by its nature will distort the jury’s deliberative process.”).

BOOK REVIEW

The Continuing Role of State Policy

New Television, Old Politics: The Transition to Digital TV in the United States and Britain, Hernan Galperin, New York, N.Y., Cambridge University Press, 2004, 311 pages.

Jeffrey A. Hart*

Hernan Galperin uses comparative case studies of the transition to digital television in the United States and Britain to address a variety of theoretical questions regarding the relative impact of political factors versus markets and technological change on regulatory regimes. The book is organized into four parts. The first part introduces the topic and provides background on digital TV. The second and third parts focus on the digital transitions in the United States and Britain, respectively. The fourth part contains summaries and conclusions.

In Chapter One, Galperin argues that three factors were the impetus for the transition to digital TV in both countries: the steady decline of the domestic consumer electronics industry, “the international diffusion of the information revolution agenda, and the spectrum shortage created by the rapid growth of mobile telephony and other wireless telecommunications services.”¹ Nevertheless, the strategies chosen to make the transition and the outcomes of these strategies differed markedly.

According to Galperin, three nation-specific factors produced variance in strategies and outcomes across the two countries: the organization of the state (cabinet-led parliamentary v. presidential

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1. HERNAN GALPERIN, *NEW TELEVISION, OLD POLITICS: THE TRANSITION TO DIGITAL TV IN THE UNITED STATES AND BRITAIN* 15 (2004) [hereinafter *NEW TELEVISION*].

government), the normative orientation of media policy, and the legacy of the analog TV regime.²

The British transition included greater efforts to foster competition in broadcasting than the U.S., partly because Britain started its transition with a lower level of competition. The dominance of the national public broadcaster, the British Broadcasting Corporation ("BBC"), was an important differentiating factor, but Galperin argues also that a major impetus for British strategy was the threat posed by the rapid success of pay TV services delivered via satellites controlled by Rupert Murdoch and his allies.

Despite its dominance, however, the BBC did not always get its way. Galperin attributes this to the British government's ability to resist capture by either public or private interests, in sharp contrast to the American system, which was the result of the centralization of power made possible by cabinet government. Overall, the "American strategy . . . privileged continuity over reform."³ The U.S. efforts at broadcasting reform were stymied by private local broadcasters who successfully used the idea of preserving "free TV" as their watchword throughout the long struggle.

Chapter Three does a good job of providing background about the regulatory regime for analog TV in the United States. Galperin describes the public interest standard for the licensing of stations by the Federal Communications Commission ("FCC") and the impact of new technologies like VCRs and cable TV. There is nothing particularly new here, but it is a good summary nonetheless.

Chapter Four summarizes the U.S. debate over high definition television ("HDTV") in the 1980s and shows how it led to the idea to pursue digital television ("DTV") in the mid 1990s. DTV included the possibility of HDTV digital broadcasts among other ways of using the spectrum allocated for DTV. The implicit deal with local broadcasters was that they would be loaned an additional television channel to experiment with digital services during the transition. They would have to return the analog channels once the transition was completed.

In Chapter Four, Galperin also discusses the changing views of the broadcasters as represented primarily by the National Association of Broadcasters ("NAB") and their ongoing battles with the cable operators as represented by the National Cable Television Association ("NCTA"). The basic conflict between the two was over "must carry" rules.⁴ Earlier FCC decisions and Supreme Court rulings had determined that cable operators

2. *Id.* at 23.

3. *Id.* at 18.

4. *Id.* at 66.

could be required to carry the signals of local broadcasters.⁵ This would have to be renegotiated for digital TV, especially if local broadcasters chose to use their digital channel for “multicasting”—broadcasting a number of standard-resolution signals (somewhat like a mini-cable system).

The Author briefly discusses the rise and decline of the linkage between the debates over HDTV and DTV and concerns over the decline in U.S. economic competitiveness *vis à vis* Japan and Western Europe. He also briefly discusses the arguments between the U.S. television and computer industries over DTV standards and the ungainly compromise on picture formats embedded in the FCC decisions of the mid 1990s.⁶ Both of these topics are covered in greater detail in other works.⁷

Chapters Five and Six deal with the changes in the DTV bargain that occurred after 1996 when the White House and key leaders in Congress demanded a quick return of the analog channels so that a spectrum auction could be used to reduce the budget deficit. The debate over the 1996 Telecommunications Act included a discussion of the DTV transition. The local broadcasters successfully lobbied for new rules that would delay the return of the analog channels. These rules required that 85 percent of households be able to receive digital signals before the broadcasters would be obliged to return their analog channels.⁸ That threshold has yet to be reached.

Chapter Seven provides a description of the European context for the British transition. The British case differs from that of the U.S. in that Britain is embedded in a larger system of governance thanks to its membership in the European Union, making this chapter absolutely necessary. After quickly reviewing the reasons for the European rejection of the Japanese proposal for HDTV standards in the mid 1980s, Galperin turns to a discussion of the politics behind the Multiplexed Analog Components (“MAC”) systems that were supposed to replace the analog color TV standards in Europe. He provides a summary of the European debate over Open Network Provision (“ONP”) standards that were designed to apply not just to telecommunications networks but to all high-bit-rate digital infrastructures, including digital broadcasting. The ONP debate played a key role in the British transition strategy because key political actors strongly embraced the ONP approach.

Chapter Eight provides a description of the regulatory regime for

5. *Id.* at 67.

6. *Id.* at 87.

7. See, e.g., JOEL BRINKLEY, *DEFINING VISION: HOW BROADCASTERS LURED THE GOVERNMENT INTO INCITING A REVOLUTION IN TELEVISION* (1997); JEFFREY A. HART, *TECHNOLOGY, TELEVISION, AND COMPETITION: THE POLITICS OF DIGITAL TV* (2004).

8. *NEW TELEVISION*, *supra* note 1, at 110.

analog television in Britain. It contains a short history of the idea of “public service broadcasting” that has played such an important role there. The BBC was never particularly well liked by Conservatives, including Winston Churchill, but it came under particularly heavy fire during the Thatcher administration. Thatcher wanted, in particular, to change the funding scheme for the BBC so that the BBC would lose its dominant position. The Major administration did not agree with this idea, however, so despite the addition of competitors to the BBC in the form of the independent television companies and Murdoch’s satellite-delivered pay TV services, the BBC managed to remain the dominant force in British broadcasting. Galperin argues that the Major administration, by separating the transmission services of the BBC from its programming and encouraging it to expand its commercial activities, made it both necessary and possible for the BBC to engage in a successful form of public entrepreneurialism during the digital transition.

Chapters Nine and Ten detail the rather baroque maneuvers that occurred once the British government decided to get serious about the digital transition. These all concerned Digital Terrestrial Television (“DTT”) since all earlier attempts in Britain other than Murdoch’s to enter the digital satellite television market had failed spectacularly and cable television had been unable to compete successfully with analog terrestrial TV or satellite pay TV.

The key players on the government side, besides the BBC, were the Independent Television Commission (“ITC”), the Department of Trade and Industry (“DTI”), and the Office of Telecommunications (“OFTEL”). The ITC was primarily responsible for decisions about licensing and a few other regulatory duties mandated by Parliament under a series of telecommunications acts. The DTI was concerned primarily with encouraging the building of high-speed digital networks and creating a more favorable environment for digital technology more generally, while the OFTEL attempted to “nurture . . . competition and prevent dominant firms from leveraging market power across the supply chain.”⁹ Competition among these agencies played an important role in the British digital transition.

Chapter Ten, which is entitled “Murdoch Phobia,” explains the outcomes of the various bids for DTT licenses on the part of various consortia, but more importantly why the competition for licenses was structured as it was. Murdoch’s attempts to compete in the DTT sphere were mostly frustrated by government elites intent on fostering a British competitor to his satellite-delivered pay TV services.

9. *Id.* at 192.

Chapter Eleven takes up the story of DTT licenses after the election of a Labour government under the leadership of Tony Blair. There was considerable continuity in policy from Major to Blair because of the two administrations' shared belief in the need for greater competition in broadcasting while preserving the public service tradition. The BBC was disappointed that the new administration did not go along with its request for major user fee increases. When the independent television companies' digital TV service failed in 2002, there was no government bailout, and a new consortium was permitted to take its place that combined the resources of the BBC and Murdoch's BSkyB. (So, no need to feel sorry for Rupert Murdoch.) Britain emerged in the end with two major digital broadcasters: the BBC and Murdoch. Was this "industrial policy through other means"?¹⁰

Galperin's comparative case studies show the enormous pressures exerted on both governments to revise their regulatory regimes. He argues that the British digital transition went more smoothly, despite its various glitches, than the American one. In Chapters Twelve and Thirteen, he suggests that cabinet-led parliamentary government in Britain, as compared with presidential government in the United States, made it possible for the British government to act against the organized interests of the broadcasting industry to establish a regulatory regime that recognized the regulatory impact of "digital convergence"—that is, the need for greater consistency of regulation of telephone networks, computer networks, and broadcasting, as high-bit-rate digital transmission technologies permitted high-quality audio and video to be carried over a variety of transmission media.

The Author argues that inter-industry coordination problems were important in both countries and that the transition was strongly influenced by state policy as a result. In Britain, "[inter-industry] coordination problems were minimized by past policy changes favoring industry consolidation, national . . . stations, and vertical integration in the pay-TV market."¹¹ In the United States, in contrast, the "organization of the state . . . stands in sharp contrast to that of Britain. In a few words, it militates against regime change and policy innovations Fragmentation of policy authority favors fragmentation of interest representation."¹² In the United States, inter-industry coordination problems and a fragmented government resulted in a more difficult transition.

In somewhat of an after note, the Author summarizes his case against the arguments of globalization theorists about the declining power of the

10. *Id.* at 226.

11. *Id.* at 266.

12. *Id.* at 255.

state: "The transition to digital TV reveals that policymakers have not passively accepted losses in their ability to organize the media sector."¹³ The two case studies show how regulatory changes actually increased the power of the state in some areas while diminishing it in others. It is thus better to speak about a *restructuring* or *reconfiguration* of the state as a major consequence of globalization, rather than a retreat. And despite globalization and the alleged tendency of globalization to produce convergence in regulation, the governments of advanced industrialized states remained sufficiently different from one another to produce different policy responses to similar challenges.

This Book's main contribution is its careful analysis of the British transition and its careful comparison of the transitions in the two countries. I have a few quibbles with Galperin's facts and interpretations. I would not have been as comfortable about pronouncing the British transition strategy superior to the American. Neither transition has resulted yet in the switching off of analog services. The projected date for the end of analog is 2009 in the U.S. and 2012 in the U.K. The British, like the rest of Europe, were blindsided by rapidly increasing demand for high-definition TV sets and programming—the Europeans decided to invest in a type of wide-screen digital TV that did not easily upgrade to high definition.¹⁴ Still, I believe Hernan Galperin has performed a great service in providing the readers of this Book with yet another reason to believe that states still have the desire and the power to shape markets even in this new and glorious age of globalization.

13. *Id.* at 287.

14. Peter Feuilherade, *Europe Lines Up for TV Innovation*, BBC News World Edition, Sept. 14, 2004, <http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/3652402.stm>.