

Without Public Peer: The Potential Regulatory and Universal Service Consequences of Internet Balkanization

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I. Introduction

1. Throughout the Internet's infancy and adolescence operators appeared to favor network connectivity at the expense of short term profits. They readily accepted and routed traffic generated by other operators with little regard for the balance of traffic flows. Such "bill and keep," "sender keep all" strategies work well when traffic flows are nearly symmetrical, or when the incremental cost of handling additional traffic approaches zero with ample unused capacity and congestion-free networks.[\[1\]](#) In its procompetitive infancy the Internet developed without marginal cost pricing mechanisms at either end-user or service provider levels. The Internet proliferated in terms of participating networks and users in large part due to the ability of Internet Service Providers ("ISPs") to access the networks of local exchange carriers for the modest price of a business telephone line and to access the networks of other ISPs often at no cost.
2. Usage insensitive pricing of Internet access can support market development initiatives, particularly when relatively few players participate, each having made a significant commitment to lease or invest in transmission facilities. With the passage of time, more ISPs have entered the marketplace, often without the need for, or interest in making substantial investments in facilities. Later entrants may serve smaller geographical regions, and may have a deliberate strategy of "free riding" the facilities investment of other operators who still agree to accept traffic at quasi-public interconnection points.[\[2\]](#) Likewise, because end user access to the Internet is typically priced on a low, flat-rated, "All You Can Eat" basis, no facility conservation incentive exists and therefore congestion can readily occur.[\[3\]](#) As congestion threatens to impede quality of service, some ISPs have responded by prioritizing traffic streams, and by varying the price of network access on the basis of the transmission capacity and traffic volume of other ISPs seeking interconnection.[\[4\]](#) This demand-based responsiveness soon might include reserved bandwidth that would provide higher service reliability and quality for a premium price.[\[5\]](#) Resorting to traditional pricing mechanisms means parties causing congestion, or contributing comparatively less to congestion abatement, will incur higher costs of doing business. The responsible parties include smaller ISPs who lack the traffic, subscribership and transmission capacity needed to sustain highly reliable service in the face of increased demand and new Internet applications that require more bandwidth. Requiring payment for access to the facilities of other larger companies constitutes an efficient outcome, but one that likely will impose comparatively higher costs on smaller and rural ISPs and their subscribers.
3. Segmenting the Internet into various levels of performance reliability with possible partitioning of bandwidth and the creation of temporary dedicated links makes the Internet appear and operate more like a conventional circuit-switched, telecommunication network. Instead of a "best efforts," "one size fits all" network topology, the Internet will become an amalgam of networks with different degrees of reliability, service quality, accessibility and cost. This diversification will

occur just as policy makers have begun to recognize the Internet's importance and the desirability of ubiquitous access. However, key decision makers have not yet addressed a critical difference in the regulatory classification of ISPs versus telecommunication carriers. The former group incurs none of the regulatory and operational burdens imposed on the latter group, because they lack the common carrier designation and accordingly bear no obligation to promote universal service[6] and to operate without discrimination of "similarly situated" users.[7]

4. It appears that the dominant interconnection model for the Internet already has begun to shift from one characterized by widespread, voluntary and non-discriminatory interconnection to a hierarchical and discriminatory model. In response to this shift an increasing number of ISPs have clustered into a self-selected group of interconnected networks possibly inaccessible from other non-member networks, or accessible only if compensated on a one-way, nonreciprocal basis. In any event the likelihood exists for more ISPs to seek compensation from both their end-users and from their networking counterparts. Accordingly, the need to mitigate congestion, rationalize Internet access pricing and streamline may result in "balkanization" of the Internet, i.e., the disaggregation of a "network of networks" into an amalgam of networks, with varying degrees of accessibility to other networks. Such a development also would likely trigger the elimination of Sender Keep All ("SKA") pricing and a preference for free and open interconnectivity between networks. These outcomes will have profound consequences on consumers and service providers alike, particularly in light of legislative and regulatory efforts to promote universal access to telecommunication networks and the Internet.
5. This article will examine the evolution of ISP interconnection arrangements with an eye toward determining the consequences resulting from the migration from SKA, zero cost interconnection arrangements to commercially driven ones modeled closely after conventional telecommunication carrier-to-carrier interconnection agreements. While such "private peering" will enhance quality of service and network reliability, it may trigger the same sort of parity and cost of access concerns raised by consumer groups, competitive local exchange carriers and other telecommunications market entrants. If balkanization of the Internet imposes higher costs on small, typically rural ISPs and their customers, then the extent of access to the Internet and degree of competition among ISPs may diminish, most notably in rural locales. A dichotomy may develop between large, competitive ISPs, able to charge low, usage insensitive rates on an averaged cost basis, and small, predominately rural ISPs who must charge comparatively higher end user subscription rates. At a time when Internet access becomes a part of the overall public policy objective of universal service, the cost of subsidizing such access will grow significantly, particularly if ISPs begin to exit rural markets. The article concludes that Internet interconnection and cost of access has begun to raise the same sort of access, equity and pricing questions raised by local and interexchange carrier interconnection, even though ISPs operate as private carriers and currently avoid the burdens of common carriage.[8]

II. Internet Cost Structures and Interconnection

6. Seamless connectivity among millions of routers, servers and users has promoted ease of use,

convenience and the opportunity for serendipitous discoveries in World Wide Web "surfing," i.e., the ability to move from one source of information to another and from carriage over one network to another at the click of a mouse. Likewise it has prompted consumers to perceive the Internet as costing nothing more than one's initial equipment purchase and a low, flat-rated monthly access charge. Consumers have incorrectly concluded that United States taxpayers largely paid for the Internet and that ongoing usage of the Internet is free. In fact while the United States government helped incubate the Internet, by 1994 it paid less than ten percent of the operational Internet "cloud" of network infrastructure.^[9] "Internet access may seem to be free--just as the electricity and heat available at one's place of work may appear to be free."^[10] One can appreciate these widespread perceptions, because consumers typically have not incurred high, usage sensitive charges.

7. The Internet constitutes a network of networks with large sunk costs borne by the providers of Internet access and services along with the telecommunications carriers that have installed the broadband transmission links used for transmitting packets of information. At least for the time being, the underlying facilities-based carriers and the providers of access to Internet-mediated content have opted not to impose substantial upfront, nonrecurring fees or usage sensitive access fees on end users. The decision to price access on an All You Can Eat ("AYCE") basis makes strategic sense during a promotional period when operators have plenty of available capacity--given its large "chunky" nature^[11]--and prospective customers require incentives to stimulate their interest in making the upfront, sunk investment in personal computers, modems, software and Internet access subscriptions.
8. Absent network congestion the cost to carry or process an additional minute of Internet traffic approaches zero, because the incremental cost is near zero. "With significant excess capacity present, short-run profits can be increased by selling at any price above incremental cost."^[12] This pricing system enhances consumer welfare, stimulates usage and revenue generation and accrues positive networking externalities^[13] as additional points of communication become available and more users derive greater utility for such expanded access opportunities--all for a flat monthly rate typically below \$25. As long as ample capacity remains available, ISPs need not meter traffic and have no reason to refuse to route traffic originating on another operator's network; to impose a traffic settlement arrangement would trigger avoidable administrative costs and apply a remedy not yet needed.
9. The remedy, an efficient settlements mechanism among an expanding set of dissimilar Internet operators, would be required under conditions of frequent network congestion resulting from increased subscribership, expanding bandwidth requirements for Internet applications and the need to upgrade networks to accommodate such demand. Under such conditions, which currently have become more commonplace, ISPs have to consider quality of service issues and determine who and what cause congestion. Such examination shows that not all Internet operators have conscientiously upgraded their networks to accommodate the traffic, and that the method for exchanging traffic has become bogged down as well.
10. Under circumstances of traffic bottlenecking, in terms of bandwidth and interconnection, the

incentive grows for ISPs--the major backbone operators in particular--to reduce the number of ISPs with which they will interconnect. This means that large volume, well capitalized operators will "peer" with, and interconnect lines with only those few other similarly situated operators,^[14] keen on maintaining high quality of service, willing to invest in the hardware needed to do so and serving a large user population. As these ISPs make the necessary investments, they grow increasingly intolerant of those operators lacking the traffic, subscribership or capital to maintain parity by expanding bandwidth to accommodate growing subscriber numbers and bandwidth intensive applications like video.^[15] Such "lagging" ISPs may have become voluntary or involuntary free riders of a sort by contributing to traffic congestion at public interconnection points, commonly referred to as Network Access Points ("NAPs"), "public peering points," or Metropolitan Area Exchanges. Such operators lack the bandwidth needed to provide a reliable intermediary service between sender and receiver.

III. Current Internet Interconnection Arrangements

11. Even now there exist several Internet network interconnection models that address, to some extent, differences in an ISP's subscribership, bandwidth and financial resources.

A. Sender Keep All

12. The SKA model allows ISPs to retain all subscriber payments without having to settle accounts with other ISPs who participate in routing and delivering traffic. This model promotes the daisy-chaining of unaffiliated networks and delivers global access to sources of information, commerce and entertainment. This model has served as the primary template for Internet traffic routing, because of its administrative convenience and the willingness of ISPs to promote network connectivity regardless of whether traffic flows are symmetrical. SKA involves network interconnection without a metering mechanism either because the parties do not care whether traffic symmetry exists, assume that such symmetry exists, or believe that metering and the settlement of financial accounts trigger more cost and inconvenience than a "rough justice" agreement to accept and route onward each others' traffic.
13. The SKA model promotes positive network externalities and universal service, because smaller and rural ISPs typically enjoy opportunities to generate more outbound traffic for free carriage by other ISPs than they receive from other ISPs for carriage onward to another ISP or for terminating traffic. The opportunity to avoid paying a penalty for being comparatively less necessary and operationally more expensive than urban ISPs translates into an opportunity for users in rural and high cost service areas to access the Internet on terms and conditions similar to what urban subscribers pay.

B. Peer-to-Peer Bilateral

14. This Internet-specific model adopts SKA, but with the expectation of traffic symmetry. Two

unaffiliated ventures agree to use this model, which requires a direct and meterless connection, if and only if they have "the same, size, experience, technology and customer base." [16] This model may eliminate the opportunity for Internet users in rural and high cost areas to pay less than full service costs, if ISPs in such areas must resort to more expensive "transit" arrangements with bigger ISPs resulting in a one-way transfer payment from the smaller ISP to larger ones.

C. Hierarchical Bilateral

15. Even before the threat of network balkanization, a hierarchy of ISPs has developed based on geographical scope of service, available bandwidth, traffic volume and subscribership. The hierarchical bilateral model applies when different types of ISPs agree to interconnect their networks. The terms and conditions of this two-party contract reflect unequal bargaining strength in the sense that a smaller ISP, denied SKA and other cost-free interconnection opportunities, now must persuade a larger ISP to handle its traffic. A negotiation in this context establishes a customer-provider, transiting relationship rather than a carrier-to-carrier or ISP peering arrangement. Increasingly, this model predominates as most national ISPs and backbone telecommunication carriers treat regional and local ISPs as "clients." Accordingly, the smaller regional and local ISP typically has to transfer funds to the bigger ISP, because the bigger operator has incurred a greater infrastructure investment burden and has the capacity and wherewithal to route the smaller ISP's traffic onward to another network or to the final destination.
16. While transfer payments occur in this model, it is important to note that no incentive exists for a likely transfer payment recipient, i.e., the bigger, national ISP, to discriminate or to deny interconnection with a smaller ISP who will pay for transiting service. If this model continued to dominate the Internet, then the free rider problem could abate without any single, financially qualified network operator facing denial of access to other networks. The smaller network operator would simply have to agree to make the necessary transfer payments and thereby have transit [17] access to servers and e-mail recipients, etc., via the switching and routing facilities of other, larger and more geographically diverse networks.

D. Third Party Administrator

17. The Third Party Administrator model involves a neutral "clearinghouse" function managed by a paid administrator that might not even operate a network. Before relinquishing all Internet management responsibilities, the National Science Foundation operated Network Access Points that served as sites for the exchange of traffic between networks. Now commercial ventures, like the Commercial Internet Exchange Association ("CIX"), perform the same function. These businesses place greater emphasis on generating a profit from administrative fees, and reflect less of a quasi-common carrier orientation, i.e., agreeing to nondiscrimination and open access to any ISP on a rational, traffic volume-based price structure.
18. The Third Party Administrator model works well when the administrator has the financial wherewithal to expand capacity and routing functions to meet demand and to maintain an adequate

level of service by enforcing requirements that ISPs maintain bandwidth and traffic processing capabilities commensurate with vastly expanding traffic growth. Currently some traffic exchange locations have become so bogged down with traffic that packets of information must be re-sent or are lost altogether.

19. ISPs, particularly ones with the largest traffic volume and available transmission capacity, are offloading some or all of their traffic onto "private peering" locations, because public peering points have become congested bottlenecks. This migration has the most adverse effect on smaller ISPs who lack the facilities investment to interconnect individually with one or more of the former large ISPs at another switching location, typically an individual ISP's "Point of Presence." A small ISP could expect to provide its subscribers with access to just about any other ISP's network simply by interconnecting with the large number of peers at a Third Party Administrator's "public peering" site. When major ISPs boycott such sites and refuse to handle traffic of lesser ISPs, the smaller ISP must scramble to find substitute ways to access the major carrier's disparate networks, typically at several different locations and a higher cost.

E. Private Peering

20. Private peering has become the most recent interconnection model and the one most likely to involve some degree of discrimination or entrance requirements. This model involves the overlay of quasi-private Internets unavailable to every ISP or Internet user, or available at a price. Private peering users purposefully deem their networks off-limits to outsiders ostensibly to preserve "network integrity" and minimal quality of service levels. However, the migration to private peering also results from the real or perceived need to safeguard a sizeable and expanding investment from the congestive effects of free riders.

IV. Current Telephony Interconnection Arrangements

21. As ISPs appear more inclined to interconnect facilities only if a transfer payment occurs, the Internet appears more like a system of telephone company networks. An understanding of how telephone companies settle accounts and route traffic may provide insight on how the Internet may evolve, despite the fact that private carriers provide service free of traditional telephone common carrier duties.
22. Interconnection between and among telecommunication carriers constitutes an essential element of what it means to operate as a common carrier. Common carriers have a legal duty to interconnect their facilities with other carriers on fair terms and conditions. No doubt exists whether a telephone company will agree to interconnect its facilities with another carrier, nor whether the interconnecting carrier should receive compensation for providing such access. Telecommunications carrier-to-carrier interconnection agreements typically involve a transfer payment when traffic flows are asymmetrical. The contractual terms and conditions for this "correspondent" or "connecting carrier" relationship primarily address traffic flow and volume without regard to a carrier's market share or size. Once qualified as a carrier, the venture receives

compensation for terminating traffic. This arrangement may involve negotiations, application of a uniform revenue division plan, or a per minute access charge.

23. Historically, the telephony compensation plan has contemplated relative parity in terms of interconnection and negotiation leverage primarily because the parties voluntarily sought to interconnect facilities and expand geographical coverage. Market entry by competitive local and long distance carriers has necessitated legislative and regulatory edicts to mandate carrier-to-carrier interconnection with some degree of government oversight of the terms and conditions for such access.^[18] Before the onset of competition, extensive carrier-to-carrier interconnection was certain and the parties focused on what type of cross-subsidies were needed to support a universal service mission.^[19] Now even the common carrier classification does not foreclose delays and brinksmanship during interconnection negotiations, particularly when the carriers have different bargaining power, traffic volumes and need for interconnection.

A. International Arrangements

24. In international telecommunications the facilities interconnection process appears to favor more dependent carriers, generating less outbound traffic, and ones with a national monopoly. The international correspondent relationship considers carriers as equals, regardless of traffic volumes. International carriers match "half-circuits" and agree to divide a previously negotiated accounting rate initially set to approximate the total cost of completing a call. Carriers often fail to renegotiate downward accounting rates to reflect lower transmission costs thereby creating incentives to retard outbound calling, or to find ways to route such calls without triggering an accounting rate settlement.^[20] Despite excessive accounting rates, international carriers have established a framework that favors direct, efficient and streamlined traffic interconnection.
25. Once correspondents negotiate an accounting rate, regulators and carriers have latitude in determining how to subdivide the complete route for purposes of tariffing and to coordinate among multiple carriers, e.g., different local and national carriers. "End-to-end" routing establishes a single rate for the completed call, while "end-on-end" routing divides the route into separate increments, e.g., local, international gateway and international carriage elements often provided by different carriers, each entitled to a portion of the established international accounting rate.

B. Domestic Arrangements

26. In addition to an access charge and SKA arrangement, Meet Point Billing provides a basis for linking telecommunication carrier settlement arrangements with the Internet's formerly predominant SKA model. The FCC has defined Meet Point Billing as:

a method for the joint provision of access service through multiple-company ordering and billing arrangements. The arrangements deal with ordering criteria for each telephone company that provides joint access service with one or more telephone companies, and enable each telephone company to provide service and bill for its portion of access service

furnished under its own tariff.[21]

27. Meet Point Billing makes it possible for end users to have only one point of contact for securing services. This promotes seamless connectivity between networks through the physical connection of lines and the integration of billing systems.
28. Meet Point Billing demonstrates how telephone carriers will cooperate if required by law, regulation or shared interest. For example, two adjoining carriers might agree to provide toll-free calling into the adjacent carrier's service territory thereby providing customers with an expanded geographical region for toll free calling. The carriers might agree to a SKA, zero compensation plan even if demographics, size of the service territory or other factors preclude the likelihood of symmetry in traffic volume. Alternatively, they might agree to settle accounts and transfer funds on the basis of traffic volume, or the distance a call traversed over each carrier's network.
29. This model provides a helpful template for achieving network interoperability, including the coordination of billing and collection for services jointly provided by two unaffiliated ventures. It provides a basis for ISPs to migrate from SKA to a system that can handle asymmetric traffic flows and different sized networks.

V. How Might the Internet Balkanize?

30. The Internet already has begun to disaggregate into a hierarchy of networks based on available bandwidth, financial resources, number of Points of Presence and subscribership. This balkanization means that not all ISPs will have direct and seamless interconnection with all other ISPs, primarily because commercial interests favor disconnection of lesser ISPs unless and until they agree to one-way transfer payments upstream to larger ISPs. Market pressures have pushed the Internet toward balkanization and so far no legislative or regulatory edict has required interconnection like that imposed on common carriers.
31. ISPs, like cable television operators,[22] enhanced services providers,[23] and private carriers do not operate as common carriers. ISPs can discriminate, refuse to interconnect facilities, deny service and decline to operate in a particular geographical area, on the twin grounds:
 - 1) that they do not offer essential public utility-type services; and
 - 2) confidence that normal marketplace resource allocation functions will match willing buyers and sellers.
32. The lack of an interconnection obligation on ISPs stems semantically from the fact that they are not common carriers, and practically on grounds that universal Internet access, while desirable, has not become a public policy objective like universal telecommunications service.[24] However, the Telecommunications Act of 1996[25] has expanded the telecommunications universal service

mission to include "[a]ccess to advanced telecommunications and information services . . . [throughout] all regions of the Nation."^[26] In conjunction with its identification of specific beneficiaries, e.g., schools and libraries,^[27] the '96 Act ordered the FCC to convene a federal-state joint board to implement the new and expanded universal service mission.^[28] Both a federal-state joint board^[29] and the FCC read the new universal service mission to include Internet access as part of an "e-rate" telecommunications discount for schools and libraries.^[30] Hence, a forward looking view of the longstanding public policy goal of ubiquitous telecommunications access could include Internet and information services access.

33. If Internet access constitutes an integral part of the a national commitment to universal service in telecommunications **and** information services, then both state and federal regulators may have a basis for considering what affirmative steps the government, ISPs and telecommunication carriers must take to promote the Internet access portion of the universal service mission. The need for heightened attention to parity of urban/rural access to the Internet stems from ongoing network disaggregation and the likelihood that rural ISPs generally may incur higher costs leading them to exit from or raise rates to particularly expensive service locales.
34. Universal Internet service concerns do not justify the reclassification of ISPs as common carriers, even though the Telecommunications Act of 1996 contains a quite broad definition of who constitutes a telecommunications carrier, and presumes such carriers will operate as common carriers.^[31] On the other hand the '96 Act also precludes application of the common carrier classification to interactive computer services, a status for which ISPs may qualify.^[32] Nothing forecloses a regulatory decision to categorize ISPs as telecommunications carriers when providing telecommunications in addition to their interactive computer services, or to require ISPs, when operating as telecommunications service providers and not consumers of telecommunications, to contribute to universal service funding.

VI. Can Federal or State Regulators Impose Interconnection Duties on ISPs?

35. Balkanization of the Internet may result in reduced and more expensive service to rural locales based on quite rational business and economic factors. Even if an ISP decided to serve such locations, it might not have the subscribership and traffic volume to qualify for private peering opportunities. Most likely operators of this sort would end up paying for interconnection and incurring transiting costs probably avoidable for most urban counterparts. The lack of competition and inelastic demand for Internet access might well offset such a comparative disadvantage, but higher cost may be unavoidable with the possible consequence of retarding demand and achievement of a universal Internet service objective.
36. The '96 Act contains a broad mandate for parity of access in urban and rural locales to advanced telecommunications and information services both in terms of availability and price.^[33] Arguably federal and state regulators could take affirmative steps to promote such availability and price

parity by imposing interconnection obligations on a public interest, parity of access to new technologies basis.

A. The Consequences of Internet Balkanization

37. Professor Hal Varian clearly identifies the balkanization quandary:

[A]s the [Internet] industry matures, settlement-free interconnect does not necessarily provide appropriate incentives to the industry players [operating the large, high bandwidth national backbone networks]. "Why should I help my competitors by giving them free access to my network?" say the [backbone managers.] . . . But the Internet won't work unless everything is connected to everything else," say the [Internet users and engineers]. . . . Both are right. Interconnection is healthy for the industry as a whole, but the current business model for interconnect may easily generate incentives for individual carriers to [deny interconnection, or to] overcharge their competitors.[\[34\]](#)

38. Professor Varian believes major Internet backbone providers can use interconnection agreements "as a strategic weapon . . . [that] could end up crippling the entire industry."[\[35\]](#) He proposes that the Justice Department and the Federal Communications Commission require backbone providers to interconnect on "fair, reasonable and nondiscriminatory" terms, the very kind of regulatory safeguard imposed on common carriers by Title II of the Communications Act of 1934, as amended.[\[36\]](#)

39. The two government agencies Professor Varian identified as regulator candidates have only limited jurisdiction to examine carrier interconnection agreements and to require expanded access. For example, this occurs when these agencies evaluate the competitive consequences of a proposed merger, like Worldcom's proposed acquisition of MCI. The FCC could provide such regulatory scrutiny if the Internet backbone carriers operated as common carriers subject to Title II of the Communications Act. But even though many ISPs have corporate affiliates that provide telecommunication lines and services as common carriers, the FCC does not classify ISPs as common carriers when they provide Internet services using the packet transmission service of a common carrier affiliate. Such offerings constitute enhanced services under the Commission's *Computer Inquiries*,[\[37\]](#) and information services[\[38\]](#) as defined by the Telecommunications Act of 1996.

40. Absent a reclassification of Internet access and service providers, the Justice Department and the FCC do not have jurisdiction to make regular and ongoing assessment of Internet operator interconnection agreements. Given a predisposition not to expand its regulatory wingspan and regulate the Internet, the FCC appears disinclined to deem as telecommunications the traffic carried via the Internet. If Internet operators do not provide telecommunications, then the Telecommunications Act of 1996 forecloses the FCC from deeming them "telecommunications service providers" and common carriers.[\[39\]](#) Accordingly, the single, integrated "network of networks" characteristic of the Internet may migrate into a multiple, tiered system of "true peers,"

based on the scope of infrastructure owned or leased and the volume of traffic generated and received. True peers self-select which ISPs with which they will interconnect. Such private peering largely segregates key national operators from the larger set of lesser, regional and local ISPs. The major backbone ISPs resorted to this option when the public peering system became congested and unreliable as too much traffic aggregated at public exchange points. What "began as a series of local cross connects between large . . . [ISPs] at the public . . . [peering points] to bypass the congested . . . switches that anchored the public exchange points,"[\[40\]](#) has evolved to a point where "lesser" ISPs cannot qualify as a peer of the major ISPs and must pay to secure the privilege of having their traffic transit such networks. Note that after negotiating a one-way transfer payment to the major ISP, the lesser ISP will receive no compensation for terminating traffic originating or transiting the major ISP's network.

B. The Regulatory Paradox

41. Just as the Internet becomes disaggregated into tiers of service providers, the overall utility of the Internet grows as it becomes a medium for real time delivery of audio, video and telephone services in addition to text and e-mail. Even as Internet operators insist they do not provide telecommunication services, the diversification of applications available via the Internet include functionally equivalent services like Internet telephony.[\[41\]](#) This similarity of services raises a regulatory quandary, because providers of Internet-mediated information services qualify for an exemption from having to contribute to a fund supporting universal telecommunications service. To make matters more difficult, Congress has expanded the universal service objective to include Internet access and to specify additional beneficiaries: libraries, schools, clinics and hospitals.
42. A number of conflicting, countervailing and paradoxical marketplace and regulatory circumstances have arisen:

As the Internet disaggregates and balkanizes, Congress nevertheless considers it a key vehicle to promote a larger, cohesive universal service mission, even though private peering may foreclose complete connectivity between and among individual networks; The Telecommunications Act of 1996, as interpreted and implemented by the FCC, includes a subsidy mechanism for Internet access at schools and libraries even though Internet service providers persist in claiming an exemption from financially supporting universal service funding; and Diversifying Internet services now include unregulated features functionally equivalent to what regulated common carriers offer.

C. FCC Reluctance to Change the Status Quo

43. In an April 1998 Report to Congress[\[42\]](#) the FCC expressed discomfort with maintaining a blanket exemption of all types of Internet telephony from universal service funding obligations:[\[43\]](#)

The record currently before us suggests that certain of these ["phone-to-phone" IP telephony] services lack the characteristics that would render them "information services" within the meaning of the statute, and instead bear the characteristics of "telecommunications services," [as defined in the Telecommunications Act of 1996]. . . .To the extent we conclude that the services should be characterized as "telecommunications services," the providers of those services would fall within the 1996 Act's mandatory requirement to contribute to universal service mechanisms.[44]

44. However, the FCC refused to take a definitive stance "in the absence of a more complete record focused on individual service offerings." [45] Still, the analysis in the Report to Congress provides significant insight on future Commission rulemakings and its assessment of how the Internet affects the Congressionally-mandated universal service mission. The Commission considers information services, a means to "buttress, not hinder, universal service," [46] particularly when such services stimulate demand for basic services that make universal service subsidy contributions. On the other hand, information services hinder the universal service mission if providers of such services also offer telecommunication services and do so in a manner that exploits regulatory anomalies and loopholes thereby exempting them from universal service obligations and reducing the funds available for subsidization. [47]

D. The Definitions of Telecommunications and Information Service

45. The FCC reiterated its view that the Telecommunications Act of 1996 legislated a regulatory dichotomy between telecommunications and information services much like what the Commission had previously done in its *Computer Inquiries* [48] regulatory proceeding and what the Modification of Final Judgment (MFJ) [49] established in setting the terms and conditions for the divestiture of the AT&T Bell Operating Companies. [50] Using historical references to its basic/enhanced services regulatory dichotomy and the telecommunications/information services dichotomy contained in the MFJ, the Commission attempted to maintain a "bright line" distinction between regulated, basic telecommunications and unregulated services that add information processing enhancements. [51] Operators providing the former have a duty to contribute to universal service funding, but providers of the latter do not.
46. Unfortunately for the FCC such a clean semantic dichotomy cannot operate in a time of rapid technological evolution and convergence. Enhanced service providers are not simply access charge exempt users of telecommunications, because to some extent they provide services to third parties and these services increasingly provide substitutes for services telecommunications carriers provide. Likewise, Congress ordered the FCC to consider the impact of mixed or hybrid services, which have both telecommunications and information service characteristics, on universal service definitions. The Commission expressly recognized that the Internet integrates both telecommunications and information services, but that ISPs "generally do not provide telecommunications." [52] However, the provision of transmission capacity to ISPs does constitute a "telecommunications service." [53] Presumably, any basic telecommunications service routed via

such leased capacity by an ISP does not absolutely convert into "information services" as defined by the Telecommunications Act,[\[54\]](#) simply because an ISP offers a blend of services over telecommunications lines.

47. In its 1998 Report to Congress the FCC also acknowledged the view of Senators Burns and Stevens that regulatory mutual exclusivity cannot work in instances where a single enterprise provides both telecommunication and information services, or for services that combine aspects of both classifications.[\[55\]](#) Nevertheless, the Commission stuck to its reliance on the semantic dichotomies established by the *Computer Inquiries* and the MFJ, and the pragmatic view that because all information services use basic transport capacity as a building block, it "would be difficult to devise a sustainable rationale under which all, or essentially all, information services did not fall into the telecommunications service category."[\[56\]](#)
48. Accordingly the Commission reiterated the need for an absolute regulatory dichotomy based on a functional analysis:

Under this interpretation, an entity offering a simple, transparent transmission path, without the capability of providing enhanced functionality, offers telecommunications. By contrast, when an entity offers transmission incorporating the "capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information," it does not offer telecommunications. Rather, it offers an "information service" even though it uses telecommunications to do so. We believe that this reading of the statute is most consistent with the 1996 Act's text, its legislative history, and its procompetitive, deregulatory goals.[\[57\]](#)

VII. Internet Telephony as a Telecommunications Service

49. As a result of its decision to stick to mutually exclusive categories, the FCC recognized the duty to categorize Internet-mediated telephony as either a telecommunication service or an information service. Despite its disinclination to regulate the Internet, the FCC acknowledged that the "record currently before us suggests that certain 'phone-to-phone IP telephony' services lack the characteristics that would render them 'information services' within the meaning of the statute, and instead bear the characteristics of telecommunications services."[\[58\]](#) "Phone-to-phone IP telephony" enables users to access Internet-mediated telecommunication services via ordinary telephone handsets and pay phones instead of specially-configured personal computers. With the ease of ordinary telephone access,[\[59\]](#) the market for Internet telephony may grow substantially. Should this occur, the financial demands of a now expanded universal service mission may exceed available funding sources.[\[60\]](#) A real potential exists for significant migration of traffic from customary switching and routing, subject to access charges and universal service funding ("USF") contribution requirements, to Internet-mediated switching and routing heretofore exempt from access charges and USF contribution requirements.

50. Because Internet telephony has several component parts, possibly offered by different companies, the FCC had to specify which aspects of Internet telephony constitute telecommunications potentially subject to regulation and the duty to make USF contributions. The Commission stated that the definition of telecommunications contained in the Telecommunications Act of 1996 limits even the potential for regulation to transmitters of voice and data traffic, thereby excluding providers of hardware and software. Accordingly "[c]ompanies that only provide software and hardware installed at customer premises do not fall within this category, because they do not transmit information."[\[61\]](#)
51. Similarly the Commission expressed an unwillingness to deem ISP-facilitated telecommunications computer-to-computer Internet telephony. While packets of voice communication are transmitted via ISP-owned or leased facilities, the Commission chose to emphasize that such voice packets are indistinguishable from the stream of other data and information packets that have no similarity to a telecommunications service. The FCC noted that an ISP may not even know that a customer has configured an Internet telephony service, using freely and easily accessed software secured from someone other than the ISP. The Commission concluded that an ISP does not provide a telecommunication service merely by serving as a conduit for accessing the Internet, because common carriers typically elect to secure that status and Title II of the Communications Act contemplates a conscious exercise of provisioning or offering telecommunications services.[\[62\]](#)
52. On the other hand, phone-to-phone Internet telephony presented the FCC with "a different case."[\[63\]](#) For ventures meeting a four-part test,[\[64\]](#) the Commission stated its tentative conclusion that the service provided constitutes telecommunications, primarily because:
- From a functional standpoint, users of these services obtain only voice transmission, rather than information services such as access to stored files. The provider does not offer a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information. Thus, the record currently before us suggests that this type of IP telephony lacks the characteristics that would render them information services within the meaning of the statute, and instead bear the characteristics of telecommunications services.[\[65\]](#)
53. Despite its preliminary assessment, the FCC refrained from making "any definitive pronouncements in the absence of a more complete record focused on individual service offerings."[\[66\]](#) The Commission deferred a more definitive resolution of these issues "pending the development of a more fully-developed record because we recognize the need, when dealing with emerging services and technologies in environments as dynamic as today's Internet and telecommunications markets, to have as complete information and input as possible."[\[67\]](#) The Commission did note that a finding that phone-to-phone Internet-mediated telephony constitutes telecommunications would trigger a mandatory USF contribution from such operators as required by Section 254(d) of the Communications Act. But even in the face of this financial contribution, the Commission implied that it might not have to subject such operators to the full array of common carrier requirements contained in the Communications Act, because Section 10 of the

Act, established by the Telecommunications Act of 1996,[\[68\]](#) permits the Commission to forbear from imposing any rule or requirement of the Communications Act on telecommunications carriers.[\[69\]](#) For example, the Commission stated that it might not have to subject providers of Internet telephony to the international accounting rate toll revenue division system, presumably because the Commission recognizes the consumer benefits accrued by access to services that can undercut and arbitrage the current, above-cost regime.

VIII. Should ISPs Contribute to Universal Service Mechanisms?

54. Section 254(d) of the Communications Act, as amended, mandates universal service contributions from "every telecommunications carrier that provides interstate telecommunications services."[\[70\]](#) In application the USF obligation has extended to paging providers, because they are providers of telecommunications service despite the limited use of the local loop and no opportunity to receive financial support themselves. Some private telecommunication carriers also must make USF payments even though they operate as non-common carriers.[\[71\]](#) In its 1998 Report to Congress the FCC stated its intention to "construe broadly the class of carriers that must contribute."[\[72\]](#)
55. On the other hand, the Commission declined to require such contributions from ISPs offering Internet-mediated services, including ones that fall within the "mixed or hybrid" category identified by Senators Stevens and Burns. The Commission chose to adhere to the functional analysis established in the *Computer Inquiries* and the MFJ, and its insistence on mutual exclusivity between telecommunications and information services. This means that the carriers leasing telecommunications transport capacity to ISPs must include the revenues derived from those lines in their universal service contribution base,[\[73\]](#) but that the ISP lessee has no such obligation.[\[74\]](#) The FCC provided:

The provision of Internet access service involves data transport elements: an Internet access provider must enable the movement of information between customers' own computers and the distant computers with which those customers seek to interact. But the provision of Internet access service crucially involves information-processing elements as well; it offers end users information-service capabilities inextricably intertwined with data transport. As such, we conclude that it is appropriately classed as an "information service."[\[75\]](#)

56. The FCC used as an illustrative example the travel planning and airline reservation services available from Microsoft Corporation via the Internet. Microsoft's Expedia World Wide Web site allows customers to check air fares and purchase airline tickets via the World Wide Web. Because users access the Expedia Web Page via telecommunication networks configured for Internet services, the FCC acknowledged that "Microsoft can be said to offer a service that 'includes telecommunications.'"[\[76\]](#) However, customers of Expedia did not seek or obtain a telecommunications service. They merely secured a link to Expedia via local and inter-exchange telecommunication carriers. "Phrased another way, Microsoft arguably offers a service that 'includes telecommunications,' but it does not 'provide' telecommunications to customers."[\[77\]](#)

57. The FCC also expressed reluctance to expand the scope of regulation and USF liability in a Report to Congress instead of a rulemaking that would provide a forum for collecting more data and views. Additionally the Commission had to consider the overall effect of the Internet and Internet telephony on the universal service mission. On one hand it is clear that phone-to-phone Internet telephony can reduce overall USF contributions by providing a loophole for functionally equivalent traffic.

If such providers are exempt from universal service contribution requirements, users and carriers will have an incentive to modify networks to shift traffic to Internet protocol and thereby avoid paying into the universal service fund or, in the near term, the universal service contributions embedded in interstate access charges. If that occurs, it could increase the burden on the more limited set of companies still required to contribute.[\[78\]](#)

58. But on the other hand a proliferating network of networks, stimulates demand for a variety of telecommunications facilities and services. The Commission acknowledged both outcomes and concluded that for the time being the Internet, and all services available via the Internet, pose no threat to universal service:

For purposes of this Report, we believe that the central issue is whether our decision that Internet access is not a "telecommunications service" is likely to threaten universal service. In other words, will Internet usage place such a strain on network resources that incumbent LECs will be unable to provide adequate service? As we noted in the *Access Reform Order*, both ILECs and the Network Reliability and Interoperability Council agreed that Internet usage did not pose any threat to overall network reliability.[\[79\]](#)

[A. Internet Usage as a Financial Threat to Conventional Carriers](#)

59. The FCC appears to have emphasized the ability of the telecommunications infrastructure to accommodate Internet access as proof that Internet-mediated telecommunications will not threaten universal service objectives. The Commission ignored or discounted the full future consequences resulting from expanding use of the Internet as a substitute for existing circuit switched telephony services. Internet operators already recognize the financial and operational dividends accruing from a legislative and regulatory classification that enables them to circumvent telecommunications regulation even as they increasingly offer substitutes for telecommunication services. Because the Internet has diversified with the number and type of operators proliferating, the major ISPs already have begun to behave and operate much like telephone companies at least insofar as how they interconnect facilities and settle accounts for handling traffic originating or terminating on another ISP's network. Technological innovations may make it possible for such ISPs to reduce or even to eliminate reliance on conventional circuit-switched facilities.

60. Under the current FCC interpretation of the '96 Act and the Commission's definition of enhanced services, ISPs can convert the Internet into a functional equivalent of an interexchange carrier's

network. Having exploited the technological versatility of the Internet to switch and route voice traffic in real time, ISPs have proceeded to demand access and transit fees no different than what a telecommunications carrier would require. Regardless of whether types of Internet telephony now constitutes telecommunications, ISPs already have revised traffic routings and facilities interconnection agreements to approximate the hierarchical characteristic of the telecommunications infrastructure.

61. If they do not already provide the functional equivalent of telecommunications, it is only a matter of time before the volume of voice traffic handled by ISPs causes the FCC to reconsider its statutory interpretations and to confirm the suspicions it raised in the Congressional Report. When an ISP provides long distance telephone service, accessed by telephone and terminated to a telephone, the intermediary transmission using the Internet Protocol does nothing to refute the view that but for the Internet option such traffic otherwise would transit conventional routes and trigger the payment of access charges and USF contributions by the interexchange carrier.
62. ISP provision of functionally equivalent long distance telephone service, while a positive arbitrage and competitive force,[\[80\]](#) has the potential to trigger two significantly adverse impacts on the universal service mission:
 - 1) ISPs may trigger a migration of long distance telephony traffic from telecommunications carriers thereby reducing the sum of funds available to support the universal service mission even as the Telecommunications Act of 1996 expands the reach and cost of this mission. Similarly, telecommunication carriers may offer their own Internet telephony services that qualify for an exemption from access charge and USF payments in response to traffic migration and despite the impact such cannibalization will have on financial margins; and
 - 2) The decision by major ISPs to restructure interconnection arrangements in a manner analogous to conventional telephone carrier-to-carrier settlements will shift costs downstream to smaller ISPs. While financially justified, imposing transit payments on small ISPs might trigger an industry consolidation and bring an end to flat-rated, averaged cost retail charges. Reduced competition may result in unserved, primarily rural areas, or at least the potential that ISPs will no longer charge a single rate regardless of user location.

B. Internet Telephony Traffic Migration and Cannibalization

63. In less than two years Internet telephony has evolved from a hobby to a business. Major incumbent telecommunications carriers like AT&T, Deutsche Telekom and MCI have embraced the technology, despite the potential for cannibalization of higher margin, conventional circuit switched services. A variety of new ventures, including VocalTec, Delta Three, IDT, and RSL Communications already offer services that substantially undercut, retail telephony rates. For example, RSL Communications recently announced international Internet telephony prices at one-half the retail rate, including a 29 cent per minute rate from the United States to Hong Kong.[\[81\]](#)

64. Currently the volume of Internet-mediated telephony is insignificant. Domestic United States long distance telephone rates have declined to only a few cents above the access charge payment made by interexchange carriers to local exchange carriers. Accordingly, unless Internet telephony provides a more efficient routing option, rather than an opportunity to evade regulator imposed surcharges, the Internet may not present much of a competitive challenge to dial up, domestic consumer services. However, with expanded Internet commerce opportunities arising, the potential exists for an Internet-mediated calls to customer service representatives and for corporations to diversify their Internet investment to include voice telephony in lieu of wide area telephone service lines, international and domestic private lines and other circuit switched options.

C. ISPs as Telephone Companies Lacking a Universal Service Mandate

65. Unlike their telecommunications carrier counterparts ISPs have no universal service mission, nor do they bear any of the rights and responsibilities incurred by common carriers. Even though the terms and conditions for Internet operator network interconnection, traffic routing and revenue settlements now parallel how telephone companies do business, the FCC does not consider ISPs to be telecommunications carriers. Accordingly, ISPs may refuse to interconnect lines with other operators. They may discriminate among operators and consumers. Additionally, they have no obligation, as do local and interexchange carriers under the '96 Act,[\[82\]](#) to average costs and provide rural consumers with the same services available in urban locales at comparable rates.
66. Despite visions of a ubiquitous national information infrastructure,[\[83\]](#) the potential exists for information superhighways to bypass rural and high cost areas absent the kind of subsidization that has supported universal telecommunication service. The goal of eliminating free riding by smaller ISPs has resulted in higher transit costs borne by downstream "client" operators. No one can object to efforts by upstream carriers, which have invested in greater bandwidth and geographical reach, to recoup infrastructure investments from non-peer operators unable or unwilling to make similar investments. But the consequences of such transit and interconnection charges may likely include market consolidation and the elimination of averaged, flat-rated consumer access to the Internet. Already the number of ISPs has significantly dropped as local and interexchange carriers seek to accrue economies of scope and as some ISPs seek to achieve a national footprint and accrue economies of scale. Recently America On Line raised its unlimited, monthly rate from \$19.95 to \$21.95. A small, rural ISP, facing higher transit fees from upstream ISPs may not be able to generate profits even if it could match the AOL flat rate, or AOL's higher charge for rural users who access the service via a more expensive wide area telephone service ("WATS") lines in lieu of a local number.
67. The combination of market consolidation and higher transit costs for client ISPs may reduce or eliminate service options for users in rural locales. Nothing forecloses such an ISP from charging higher rates in markets lacking robust competition. If rural consumers incur higher costs to access the Internet--as financially justified as this may be--then the differential in market penetration rates between urban and rural areas will expand. The universal service support mechanism currently in

place can only subsidize Internet access in schools and libraries and not from individual residences. Hence, we may see declining opportunities for low cost Internet access at the very time Internet services and features proliferate.

IX. Conclusions

68. Technological and marketplace conditions favor increased reliance on the Internet as the preferred medium for both interactive information *and* telecommunications services. In advance of legislative and regulatory responses to the Internet's maturation, ISPs already have revised their interconnection and settlement agreements to reflect a hierarchical infrastructure more akin to the telecommunications industrial structure than a flat and democratic "network of networks." Many ISPs now offer the functional equivalent of telecommunications services and they have implemented a financial settlement system that accounts for the use of each other's facilities for "transiting" traffic.
69. Already the foundation exists for the Internet to merge with, or become indistinguishable from the various carrier networks that provide telecommunications. Most incumbent telecommunications carriers already provide Internet services and increasingly ISPs provide telecommunications services, often via the telecommunication facilities of incumbent local and interexchange carriers. This technological and marketplace convergence will necessitate legislative and regulatory responses to eliminate asymmetrical regulations and other anomalies that distort the marketplace. Until such adjustments occur, we cannot easily determine whether an Internet-mediated, packet-switched telecommunication service operates more efficiently than conventional circuit switched services. Regardless of its comparative efficiency, the Internet will become a desirable alternative for routing telecommunications traffic, simply because both carriers and consumers can evade having to pay access charges and contribute to universal service funding.
70. State and Federal regulators have often used asymmetrical regulation to incubate technologies and to stimulate competition. Clearly the Internet has thrived in the mostly unregulated environment ISPs currently enjoy. But at some point, the Internet will have matured and diversified to a point where a preferential regulatory status unfairly tilts the competitive playing field and creates unnecessary marketplace distortions. The Internet has the capacity and versatility to become a one-size-fits-all telecommunication and information services medium. As it becomes an essential medium, it likewise will become the focal point for universal service initiatives, even as ISPs now avoid financially supporting this mission.

Footnotes

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[1] "For most usage, the marginal packet placed on the Internet is priced at zero." Jeffrey K. MacKie-Mason & Hal R. Varian, *Economic FAQs About the Internet*, in *INTERNET ECONOMICS* 27, 39 (Lee W. McKnight & Joseph P. Bailey eds., 1997).

[2] Rather than lease lines throughout the nation and expand capacity, the free rider ISP may attempt to hand off traffic to a larger, better equipped ISP at the closest public peering point. The free rider ISP considers traffic a "hot potato" and has a financial incentive to pass such traffic off to any other ISP who agrees to take it.

[3] "Nearly all usage of the Internet backbones is unpriced at the margin. Organizations pay a fixed fee in exchange for unlimited access up to the maximum throughput of their particular connection. This is a classic problem of the commons. The externality exists because a packet-switched network is a shared-media technology: each extra packet that Sue User sends imposes a cost on all other users because the resources Sue is using are not available to them. This cost can come in the form of delay or lost (dropped) packets." MacKie-Mason & Varian, *supra* note 1, at 40-41.

[4] Other pricing mechanisms under consideration consider service quality and demand elasticity. The Resource Reservation Protocol ("RSVP") will establish a virtual, dedicated link between end-user, also known as the "client," and the desired source of information, also known as the "server."

[5] For background on Internet pricing alternatives *see, e.g.*, Richard A. Cawley, *Interconnection, Pricing, and Settlements: Some Healthy Jostling in the Growth of the Internet*, in *COORDINATING THE INTERNET* 346-376 (Brian Kahin & James H. Keller eds., 1997); Nicholas Economides, *The Economics of Networks*, 14 *INT'L J. INDUS. ORG.* 673 (1996); T.B. Fowler, *Internet Access and Pricing: Sorting Out the Options*, 21 *TELECOMM. POL.* 44-52 (1997).

[6] "Since its inception in the 1930's, it has been the policy of the FCC to promote service to all households that desire telephone service. Telephone service provides a vital link to emergency services, to other government services, and to surrounding communities. For many years the support mechanisms for high cost areas were handled privately by the telephone industry, primarily by AT&T. With the break up of AT&T in the early 1980's, the FCC set up a mechanism to ensure that the rates of local telephone companies would remain affordable to consumers. The FCC's programs to assist low income consumers, described in detail below, began in 1985. These programs reduce the monthly local telephone charges for low income consumers and assist them with initiation fees for local telephone service." Federal Communications Commission, *Consumer Information, The FCC's Universal Service Support Mechanisms*, (visited July 10, 1998)

<http://www.fcc.gov/Bureaus/Common_Carrier/Factsheets/univers.html>.

[7] Title II of the Communications Act of 1934, as amended, 47 U.S.C. §§ 201-275 (1997) *inter alia* requires telecommunications common carriers to establish "just and reasonable . . . charge[s], practice[s], classification[s], or regulation[s]." 47 U.S.C. § 201(b). Section 201(a) makes it unlawful for "any common carrier to make any unjust or unreasonable discrimination in charges, practices, classifications,

regulations, facilities, or services." "The Commission . . . requires carriers to ensure that individually-negotiated service offerings are available to similarly-situated customers, regardless of their geographic location." Order on Reconsideration, Policy and Rules Concerning the Interstate, Interexchange Marketplace, Implementation of Section 254(g) of the Communications Act of 1934, as amended, CC Docket No. 96-61, 12 F.C.C.R. 15014, 15051 (Aug. 20, 1997) (citing Report and Order, Policy and Rules Concerning the Interstate, Interexchange Marketplace; Implementation of Section 254(g) of the Communications Act of 1934, as amended, CC Docket No. 96-61, 11 F.C.C.R. 9564, 9577 (Aug. 7, 1996)).

[8] For analysis of the traditional differences between common and private carriers and how circumstances reduce such distinctions, *see generally*, Robert M. Frieden, *Schizophrenia Among Carriers: How Common Carriers and Private Carriers Trade Places*, 3 MICH. TELECOMM. & TECH. L. REV. 2 (1997) <<http://www.law.umich.edu/mttlr/volthree/frieden.html>>; Robert M. Frieden, *Contamination of the Common Carrier Concept in Telecommunications*, 19 TELECOMM. POL. 685-697 (1995).

[9] Lee W. McKnight & Joseph P. Bailey, *An Introduction to Internet Economics*, in INTERNET ECONOMICS, *supra* note 1, at 4.

[10] *Id.* at 5.

[11] The deployment of a new telecommunications and information processing facility typically brings on-line substantial, additional capacity. It may take some time for additional demand to fill up the additional available capacity. Until such time, ISPs may view the dormant capacity as available for little if any additional cost.

[12] Padmanabhan Srinagesh, *Internet Cost Structures and Interconnection Agreements*, in INTERNET ECONOMICS, *supra* note 1, at 131.

[13] A positive network externality exists when the cost incurred by a user of the Internet does not fully reflect the benefit derived with the addition of new users and points of communications. *See, e.g.*, Joseph Farrell & Garth Saloner, *Standardization, Compatibility and Innovation*, 16 RAND J. ECON. 70 (1985); Michael L. Katz & Carl Shapiro, *Network Externalities, Competition and Compatibility*, 75 AM. ECON. REV. 424 (1985).

[14] "The Internet backbone is the data network's equivalent of long--distance service for voice communications. Fewer than 40 companies provide Internet backbones and only about five dominate the market." Jonathan Marshall, *Concerns Over WorldCom, MCI Merger Mount*, S.F. CHRONICLE, Mar. 11, 1998, at B1.

[15] For example in 1997 UUNet, a major Internet backbone provider decided to reduce the number of its SKA peering agreements and replace them with a "for compensation transit" agreement. "To qualify as a

UUNet peer now, a company must operate a national network with a dedicated, diversely routed 'backbone' of high capacity, which can connect to UUNet's backbone at that same speed in at least four geographically diverse locations." Beth Berselli, *UUNet Outdistances Its Peers; Smaller Providers Decry A New Fee for Service*, WASHINGTON POST, Sept. 8, 1997, at F17.

[16] Joseph P. Bailey, *The Economics of Internet Interconnection Agreements*, in INTERNET ECONOMICS, *supra* note 1, at 161.

[17] For background on the manner by which international carriers agree to switch and route each others' traffic, *see generally* Rob Frieden, INTERNATIONAL TELECOMMUNICATIONS HANDBOOK (1996).

[18] Incumbent carriers do not need interconnection with these new carriers to achieve expanded geographical coverage. Accordingly incumbent carriers have no incentive to interconnect and recognize that such interconnection promotes traffic and revenue migration. *See* First Report and Order, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, 11 F.C.C.R. 15499, 15612 (Aug. 8, 1996) [hereinafter *Local Competition First Report and Order*]; Order on Reconsideration, Implementation of the Local Competitive Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, 11 F.C.C.R. 13042 (Sept. 27, 1996); Second Order on Reconsideration, FCC 96-476 (rel. Dec. 16, 1996), *Iowa Utilities Board v. FCC*, and *consolidated cases*, 109 F.3d 410 (8th Cir. 1996). Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, Second Report and Order, and Memorandum Opinion and Order, FCC 96-333 (rel. Aug. 8, 1996) (Second Interconnection Order); *Bell Atlantic Telephone Companies v. FCC*, (D.C. Cir. Sept. 16, 1996), *California v. FCC*, (8th Cir. Sept. 23, 1996), *SBC Communications, Inc. v. FCC*, (D.C. Cir. 1996).

[19] In the United States the "settlements and separations" cost allocation process between AT&T and both affiliated and unaffiliated carriers constituted a major source of revenues for underwriting the below cost provision of local telephone services. Prior to imposition of the access charge system, "the charges for using the long-distance network [were] artificially inflated (on the order of sixty percent) because customers [were] required, by the 'separations and settlements' process to contribute to the payment of costs that would not be avoided even if their long-distance calling were curtailed." Alfred Kahn, *The Road to More Intelligent Telephone Pricing*, 1 YALE J. ON REG. 139, 141-142 (1984). "'Separations and settlements' is the process by which investments and expenses of telephone companies are allocated between the interstate and intrastate jurisdictions and, similarly, between intrastate toll calling and local exchange rates. Such allocations provide a mechanism by which revenue requirements for interstate and intrastate operations are developed." *Id.* at 142 n.10. For some rural LECs the toll revenue division process with AT&T Long Lines generated well over half of the carriers' total revenues.

[20] For a complete history of accounting rate regulation by the Federal Communications Commission, *see* Rob Frieden, *International Toll Revenue Division: Tackling the Inequities and Inefficiencies*, 17 TELECOMM. POL. 221-233 (1993); Leland Johnson, *Dealing With Monopoly In International Telephone Service: A U.S. Perspective*, 4 INFO. ECON. & POL. 225 (1989/91); Ken Cheong & Mark Mullins,

International Telephone Service Imbalances Accounting Rates and Regulatory Policy, 15 TELECOMM. POL. 107-118 (1991); Kenneth B. Stanley, *Balance of Payments Deficits, and Subsidies in International Communications Services: A New Challenge to Regulation*, 43 ADMIN. L. REV. 411 (1991); Robert Frieden, *Accounting Rates: The Business of International Telecommunications and the Incentive to Cheat*, 43 FED. COMM. L. J. 111 (1991); Henry Ergas & Paul Peterson, *International Telecommunications Settlement Arrangements--An Unsustainable Inheritance?*, 15 TELECOMM. POL. 29 (1991).

[21] Report and Order, 800 Data Base Access Tariffs and the 800 Service Management System Tariff, CC Docket No. 93-129, 11 F.C.C.R. 15227 n.322 (Oct. 28, 1996) *citing* Memorandum Opinion and Order, Waiver of Access Billing Requirements and Investigation of Permanent Modifications, CC Docket No. 86-104, 2 F.C.C.R. 4518 (July 31, 1987). The FCC defines a Meet Point as "a point, designated by two carriers, at which one carrier's responsibility for service begins and the other's ends. A meet point interconnection arrangement requires each carrier to build and maintain its network to the meet point. Each carrier also pays its share of the cost of the interconnection arrangement." Notice of Proposed Rulemaking, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, 11 F.C.C.R. 14171 n.80 (Apr. 19, 1996).

[22] *See Midwest Video Corp. v. FCC*, 571 F.2d 1025 (8th Cir. 1978), *aff'd* 440 U.S. 689 (1979) (overturning FCC public access requirements on grounds that cable television does not constitute common carriage).

[23] The FCC first attempted to create a "bright line" separation between enhanced service functions, which are unregulated and subject to robust competition and basic transport capacity that is regulated and not robustly competitive. *See* Second Computer Inquiry, Final Decision, 77 F.C.C.2d 384 (1980) *modified* 84 F.C.C.2d 50 (1980), *further modified*, 88 F.C.C.2d 512 (1981), *aff'd sub nom. Computer & Communications Indus. Ass'n v. FCC*, 693 F.2d 198 (D.C. Cir. 1982). However, the Commission subsequently decided that structural separation imposed unnecessary costs and burdens. It opted for non-structural safeguards like account auditing and the complaint process. *See* Third Computer Inquiry, Report and Order, 104 F.C.C.2d 958 (1986), *modified* 2 F.C.C.R. 3035 (1987), *further recon.*, 3 F.C.C.R. 1135 (1988); Phase II, Report and Order, 2 F.C.C.R. 3072 (1987), *recon. denied*, 3 F.C.C.R. 1150 (1988); *partially reversed and remanded sub nom., California v. FCC*, 905 F.2d 1217 (9th Cir. 1990), *on remand*, 6 F.C.C.R. 7571 (1991), *partially reversed and remanded sub nom., California v. FCC*, 39 F.3d 919 (9th Cir. 1994). *See also* Robert M. Frieden, *The Third Computer Inquiry: A Deregulatory Dilemma*, 38 FED. COMM. L.J. 383 (1987); Robert M. Frieden, *The Computer Inquiries: Mapping the Communications/Information Processing Terrain*, 33 FED. COMM. L.J. 55 (1981).

[24] "The current universal service system is a patchwork quilt of implicit and explicit subsidies. These subsidies are intended to promote telephone subscribership, yet they do so at the expense of deterring or distorting competition. Some policies that traditionally have been justified on universal service considerations place competitors at a disadvantage. Other universal service policies place the incumbent LECs at a competitive disadvantage. For example, LECs are required to charge interexchange carriers a Carrier Common Line charge for every minute of interstate traffic that any of their customers send or

receive. This exposes LECs to competition from competitive access providers, which are not subject to this cost burden. Hence, section 254 of the [Telecommunications Act of 1996] Act requires the Commission, working with the states and consumer advocates through a Federal/State Joint Board, to revamp the methods by which universal service payments are collected and disbursed." Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers, 11 F.C.C.R. 15499 (1996). *See also* Federal-State Joint Board on Universal Service, Report and Order, 12 F.C.C.R. 8776 (1997), *modified*, 12 F.C.C.R. 10095 (1997).

[25] Telecommunications Act of 1996, 47 U.S.C. § 151 (1996).

[26] 47 U.S.C. § 254(b)(2).

[27] The 1996 Act specifically identified universal service beneficiaries: "Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas." 47 U.S.C. § 254(b)(3), as well as "schools, health care [facilities] and libraries." 47 U.S.C. § 254(b)(6).

[28] Federal-State Joint Board on Universal Service, Notice of Proposed Rulemaking and Order Establishing Joint Board, 11 F.C.C.R. 18092 (1996).

[29] Federal-State Joint Board on Universal Service, Recommended Decision, 12 F.C.C.R. 87 (1996).

[30] Federal-State Joint Board on Universal Service, Report and Order, 12 F.C.C.R. 8776 (1997); Federal-State Joint Board on Universal Service, Fourth Order, Report and Order, 13 F.C.C.R. 5318 (1997).

[31] The 1996 Act defines telecommunications to mean "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." 47 U.S.C. § 153(43). "[A]ny provider of telecommunications services" shall constitute a telecommunications carrier and "shall be treated as a common carrier under this Act only to the extent that it is engaged in providing telecommunications services." 47 U.S.C. § 153(44).

[32] "Nothing in this section shall be construed to treat interactive computer services as common carriers or telecommunications carriers." 47 U.S.C. § 223(e)(6). The Communications Act defines interactive computer service as "[a]ny information service, system, or access software provider that provides or enables computer access by multiple users to a computer server, including specifically a service or system that provides access to the Internet and such systems operated or services offered by libraries or educational institutions." 47 U.S.C. § 230(e)(2).

[33] "Consumers in all regions of the Nation, including low-income consumers and those in rural, insular, and high cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably

comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas." 47 U.S.C. § 254(b)(3).

[34] Hal R. Varian, *How to Strengthen The Internet's Backbone*, WALL ST. J., June 8, 1998, at A22.

[35] *Id.*

[36] *Id.*

[37] *Computer Inquiries*, *supra* note 23.

[38] Section 3 (20) of the Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, signed into law Feb. 8, 1996, *codified at* 47 U.S.C. § 153(20) defines information services as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information via telecommunications." For an example of how Internet service providers interpret the Telecommunications Act of 1996 to support continued unregulated status, *see, e.g.*, Federal-State Board on Universal Service, *Comments of the Commercial Internet Exchange Association*, (visited Oct. 4, 1998) <<http://www.cix.org/docs-98/cix98-05.html>> (arguing that Internet access providers should not have to contribute to a fund supporting universal telecommunication service, because they are information service providers not telecommunications carriers).

[39] The 1996 Act defines telecommunications 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." 47 U.S.C. § 153(43). A telecommunications carrier "shall be treated as a common carrier . . . [when] providing telecommunications services." 47 U.S.C. § 153(44).

[40] Michael Gaddis, *Brokered Private Peering (BPP) Group*, (visited Oct. 4, 1998) <<http://boardwatch.internet.com/mag/98/may/bwm29.html>>.

[41] For background on the possible regulation of Internet telephony, *see* Robert M. Frieden, *Dialing for Dollars: Will the FCC Regulate Internet Telephony?*, 23 RUTGERS COMPUTER & TECH. L.J. 47 (1997), and Dennis W. Moore, Jr., *Regulation of the Internet and Internet Telephony Through the Imposition of Access Charges*, 76 TEX. L. REV. 183 (1997).

[42] Federal-State Joint Board on Universal Service, Report to Congress, 13 F.C.C.R. 11501 (1998) [hereinafter *1998 Universal Service Report to Congress*].

[43] The FCC responded to an amendment to an Appropriations Act passed on November 27, 1997. *See* Departments of Commerce, Justice, and State, the Judiciary, and Related Agencies Appropriations Act, 1998, Pub. L. No. 105-119, 111 Stat. 2440, 2521-2522, § 623. The Appropriations Act required the Commission to submit a report to Congress, no later than April 10, 1998, providing a detailed review of

the Commission's interpretations and implementation of language contained in the Telecommunications Act of 1996:

Specifically, Congress required the FCC to review: (1) the definitions of "information service", "local exchange carrier", "telecommunications", "telecommunications service", "telecommunications carrier", and "telephone exchange service" that were added to section 3 of the Communications Act of 1934 (47 U.S.C. 153) by the Telecommunications Act of 1996 and the impact of the Commission's interpretation of those definitions on the current and future provision of universal service to consumers in all areas of the Nation, including high cost and rural areas; (2) the application of those definitions to mixed or hybrid services and the impact of such application on universal service definitions and support, and the consistency of the Commission's application of those definitions, including with respect to Internet access under section 254(h) of the Communications Act of 1934 (47 U.S.C. 254(h)); (3) who is required to contribute to universal service under section 254(d) of the Communications Act of 1934 (47 U.S.C. 254(d)) and related existing Federal universal service support mechanisms, and of any exemption of providers or exclusion of any service that includes telecommunications from such requirement or support mechanisms; (4) who is eligible under sections 254(e), 254(h)(1), and 254(h)(2) of the Communications Act of 1934 (47 U.S.C. 254(e), 254(h)(1), and 254(h)(2)) to receive specific Federal universal service support for the provision of universal service, and the consistency with which the Commission has interpreted each of those provisions of section 254; and (5) the Commission's decisions regarding the percentage of universal service support provided by Federal mechanisms and the revenue base from which such support is derived.

[44] *1998 Universal Service Report to Congress*, *supra* note 42 at ¶ 3.

[45] *Id.*

[46] *Id.*

[47] *See id.* at ¶ 4.

[48] *See supra* note 23.

[49] *United States v. AT&T*, 552 F. Supp. 131 (D.D.C. 1982), *aff'd sub nom. Maryland v. United States*, 460 U.S. 1001 (1983); *United States v. Western Elec. Co.*, 569 F. Supp. 1057 (D.D.C. 1983) (Plan of Reorganization), *aff'd sub nom. California v. United States*, 464 U.S. 1013 (1983).

[50] "Reading the statute closely, with attention to the legislative history, we conclude that Congress intended these new terms to build upon frameworks established prior to the passage of the 1996 Act. Specifically, we find that Congress intended the categories of 'telecommunications service' and 'information service' to be mutually exclusive, like the definitions of 'basic service' and 'enhanced service' developed in our *Computer II* proceeding, and the definitions of 'telecommunications' and 'information

service' developed in the Modification of Final Judgment that divested the Bell Operating Companies from AT&T." *1998 Universal Service Report to Congress, supra* note 42 at ¶ 13.

[51] Even before its 1998 Report to Congress the FCC chose to establish mutual exclusivity between telecommunications and information services. *See* In the matter of Implementation of the 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 Rulemaking, 11 F.C.C.R. 21905, 21955-56, ¶ 102 (1996), Order on Reconsideration, 12 F.C.C.R. 2297 (1997), *further recon. pending*, Second Report and Order, 12 F.C.C.R. 15756 (1997), *aff'd sub nom. Bell Atlantic Telephone Companies v. FCC*, 131 F.3d 1044 (D.C. Cir. 1997). The Commission concluded that protocol processing services were information services, rejecting the possibility of treating such services as telecommunications and thus potentially making them subject to Title II regulation. *Id.* at 21956-57, ¶¶ 104-05; *see also* Universal Service Order, 12 F.C.C.R. at 9179-80.

[52] *1998 Universal Service Report to Congress, supra* note 42 at ¶ 15.

[53] "Moreover, we clarify that the provision of transmission capacity to Internet access providers and Internet backbone providers is appropriately viewed as 'telecommunications service' or 'telecommunications' rather than 'information service,' and that the provision of such transmission should also generate contribution to universal service support mechanisms." *Id.*

[54] The Communications Act of 1934 now defines information service as "the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information via telecommunications, and includes electronic publishing, 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." 47 U.S.C. § 153(20) (1997).

[55] "Senators Stevens and Burns indicate, an information service provider transmitting information to its users over common carrier facilities such as the public switched telephone network is a 'telecommunications carrier.'" *1998 Universal Service Report to Congress, supra* note 42 at ¶ 34. The Commission understands the concept of mixed or hybrid services to refer to "services in which a provider offers a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing or making available information via telecommunications, *and* as an inseparable part of that service transmits information supplied or requested by the user." *Id.* at ¶ 56 (emphasis added).

[56] *Id.* at ¶ 57.

[57] *Id.* at ¶ 39. More simply the Commission stated: "A telecommunications service is a telecommunications service regardless of whether it is provided using wireline, wireless, cable, satellite, or some other infrastructure. Its classification depends rather on the nature of the service being offered to customers. Stated another way, if the user can receive nothing more than pure transmission, the service is a telecommunications service. If the user can receive enhanced functionality, such as manipulation of

information and interaction with stored data, the service is an information service." *Id.* at ¶ 59.

[58] *Id.* at ¶ 83.

[59] Internet telephony "offer[s] users the ability to call from their computer to ordinary telephones connected to the public switched network, or from one telephone to another. . . . [A] user first picks up an ordinary telephone handset connected to the public switched network, then dials the phone number of a local gateway. Upon receiving a second dialtone, the user dials the phone number of the party he or she wishes to call. The call is routed from the gateway over an IP network, then terminated through another gateway to the ordinary telephone at the receiving end." *Id.* at ¶ 84.

[60] In June 1998, the FCC limited the amount of funds available for universal service subsidies to schools and libraries in response to a financial shortfall in funds raised from interexchange carriers and the decision of most carriers to impose a USF surcharge on consumers. *See* Federal Communications Commission, *FCC Reforms Universal Service Support Mechanism for Schools and Libraries*, CC Docket No. 96-45, (visited June 22, 1998) <http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1998/nrcc8043.html>.

[61] *1998 Universal Service Report to Congress*, *supra* note 42 at ¶ 86.

[62] "Without regard to whether 'telecommunications' is taking place in the transmission of computer-to-computer IP telephony, the Internet service provider does not appear to be 'provid[ing]' telecommunications to its subscribers." *Id.* at ¶ 87 (footnotes omitted).

[63] *Id.* at ¶ 88.

[64] An Internet telephony provider subject possibly subject to USF contribution requirements must meet the following conditions: (1) it holds itself out as providing voice telephony or facsimile transmission service; (2) it does not require the customer to use CPE different from that CPE necessary to place an ordinary touch-tone call (or facsimile transmission) over the public switched telephone network; (3) it allows the customer to call telephone numbers assigned in accordance with the North American Numbering Plan, and associated international agreements; and (4) it transmits customer information without net change in form or content. *Id.*

[65] *Id.* at ¶ 89.

[66] *Id.* at ¶ 90.

[67] *Id.*

[68] 47 U.S.C. § 160.

[69] *See 1998 Universal Service Report, supra* note 42 at ¶ 92.

[70] The Commission concluded that to be a mandatory contributor to universal service under section 254(d): (1) a telecommunications carrier must offer "interstate" "telecommunications"; (2) those interstate telecommunications must be offered "for a fee"; and (3) those interstate telecommunications must be offered "directly to the public, or to such classes of users as to be effectively available to the public." Universal Service Order, 12 F.C.C.R. at 9173, *citing* 47 U.S.C. §§ 153(22), 153(43), and 153(46).

[71] For example, the Commission held that operators of interstate private networks that lease excess capacity on a non-common carrier basis should contribute to universal service. *See* Universal Service Order, 12 F.C.C.R. at 9178.

[72] *1998 Universal Service Report to Congress, supra* note 42 at ¶ 16.

[73] *Id.* at ¶ 67.

[74] The Commission did acknowledge the difficulty in concluding whether a universal service contribution should come from an ISP that also happens to operate as a telecommunication carrier and has provisioned the transport capacity used by the ISP. Currently carriers using transmission capacity for "internal needs" have no USF obligation as to such capacity, but the Commission stated its intent to examine the matter in a future proceeding. *Id.* at ¶ 70.

[75] *Id.* at ¶ 80 (citations omitted).

[76] *Id.* at ¶ 145.

[77] *Id.*

[78] *Id.* at ¶ 98.

[79] *Id.* at ¶ 97.

[80] For example, Internet telephony does not trigger an international accounting rate settlement and places significant downward pressure on above-cost rates. *See* Rob Frieden, *The Impact of Call-Back and Arbitrage on the Accounting Rate Regime*, 21 TELECOMM. POL., No. 9/10, 819-827 (1997).

[81] *RSL Communications Ltd. Introduces International Internet Phone Calls*, BUS. WIRE, Jan. 21, 1998.

[82] *See* Communications Act of 1996, as amended, 47 U.S.C. § 254(b)(3).

[83] See Vice President Al Gore, *Remarks as Delivered to the Superhighway Summit* (Jan. 11, 1994), available at <<http://www.whitehouse.gov/WH/EOP/OVP/other/superhig.txt>> ¶¶ 54, 58 (visited June 18, 1998); Vice President Al Gore, *Bringing Information to the World: The Global Information Infrastructure*, 9 HARV. J.L. & TECH. 1 (Winter 1996); see also WILLIAM J. DRAKE, INTRODUCTION: THE TURNING POINT, in *THE NEW INFORMATION INFRASTRUCTURE: STRATEGIES FOR U.S. POLICY* 4-8 (William J. Drake ed., 1995).