

IIP Universal Service Comment
To Connect a Nation: Convergence and Choice Toward a New
Theory of Universal Service

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I. Why Universal Service Matters

There was a time when gaps in the social fabric ripped the picture of America as the land of opportunity. Franklin D. Roosevelt addressed the reality of that image when, at his second inaugural, he looked out beyond his audience and declared, "I see one-third of a nation ill-housed, ill-clad, ill-nourished" and, in so doing tapped into one of the most enduring apprehensions of the American psyche. Americans, then, found Roosevelt's gaps terrifying. Today, we find a second set of gaps discomfoting.

That gaps fix our attention shouldn't surprise us. After all, we have built our edifice of democracy on the promise of freedom and justice for all; and, over the centuries we have come to emphasize the all. Entering the Information Age, we carry our convictions with us. No matter the new era, we firmly believe that access to communications technologies is the primary policy tool for enabling all citizens to participate in those political, economic and social activities fundamental to a democratic society that is also a good society.

Our purpose here is to provoke discussion aimed at envisioning possibilities beyond the present state of Universal Service. In this essay, we propose a universal service regime:

Where an individual may choose as a basic bundle those services most suited to his or her needs;

Where a single regulatory regime governs telephony, broadband, and Internet; and,

Where financial support is equitably shared among consumers and providers.

Each section of this paper addresses an area of needed: the basic service; the regulatory regime; and, the funding mechanism. Taken together, they constitute a new theory.

A. The Centrality of Participation to a Flourishing Democracy

In this essay, we propose an informed choice policy model (ICM) of universal service that begins with the notion that people should choose for themselves the configuration of universal service options that best suits their particular needs. This may seem an unusual orientation to Universal Service, since public policy does not typically alter its track in response to consumer demand; still, consumer demand does motivate innovation in telecommunications, and it is this premise that underlies our recommendations. Sometimes conditions call for thinking beyond familiar borders; and, since both technology and consumer behavior are moving toward an Internet-based environment, it makes sense to revise the current configuration of universal service to embrace this trend. But first let us begin by recognizing the value of access to economic, political, and social life.

1. The Political Value of Access

Democracy requires an informed and involved citizenry, something possible only when its citizens have access to information about their government and the opportunity to participate in political discourse. Once one accepts the premise of the Declaration of Independence -- that governments derive 'their just power from the consent of the governed' -- it follows that the governed must, in order to exercise their right to consent, have full freedom of expression both in forming individual judgments and in contributing to the common judgment.

Even if the importance of political information is obvious, it is extremely difficult to become an informed citizen. Watching television or reading the newspaper is not enough; the political process requires more than simply receiving news about politics and political issues. At the level of local democracy, political participation involves communicating with a public official, a fair housing advocate, or a representative of the American Association of Retired Persons. It requires citizens to register

complaints with public officials, to inquire about polling places, and to learn the operating hours of public agencies.

There are, then, two dimensions of political participation -- reception and distribution. On the reception side, citizens are better able to make informed contributions and to receive the benefits of the political process when they have heard a variety of opinions, especially when they have heard their favored opinions challenged in the marketplace of ideas. On the distribution side, citizens also benefit when individuals are able to communicate and to engage in political discourse beyond the confines of their immediate communities. Only then, can democratic discourse transcend the walls of localness and the stifling of popular debate that occurs when only elites have access to the national channels of communication.

Participation brings one additional benefit, as well. Democracies depend primarily on voluntary compliance rather than coercion to obtain adherence to laws and values. People are much more inclined to feel bound by and invested in the political process when they have effective involvement in that process. Conversely, alienation from that process is likely to lead to both anger and noncompliance.

2. The Economic Value of Access

When the delegates to the constitutional convention met, they did so in part to resolve interstate economic conflict that hindered both interstate and international commerce. A major reason for the convention's actions was to change the form of the federal government to enable it to effectively address national commercial problems.

The document resulting from their deliberations did more than restructure the country's economic framework, however. Through the commerce, currency, post office, and other clauses, it granted the federal government authority to shape economic activities that positively affected individuals' as well as society's economic interests. A close examination of the Constitution confirms that the founders envisioned citizens as economic consumers and producers.

In the information age, information networks distribute

economic goods and services, and add value to transactions. Networks carry information that becomes input to decisions, as well as carrying information that itself is the product. Thus, the economic benefits of an interconnected information infrastructure accrue to the individuals on that network, to the network owners, and to society as a whole. Today, a telephone is needed to obtain most well-paying jobs; whereas, without one, it is difficult to order from a catalogue, find the schedule for the next bus, or get homework assignments. Conversely, without access to basic communications services, a person is less likely to get a job when a potential employer cannot return a call, and more likely to become an economic burden on society.

As America becomes an economy that increasingly produces and distributes information, maximizing access to the interconnected information infrastructure becomes crucial for businesses and individuals. To that end, universal service has historically been the mechanism that maximizes economic access.

3. The Social Value of Access

The writers of the Declaration of Independence included the pursuit of happiness in their list of inalienable rights. At the tip of the 21st century, it seems reasonable that access to an interconnected information infrastructure is crucial because individuals need access to information for self-development, for help in maintaining social relationships, to educate themselves, and to feed the spirit -- that is for the pursuit of happiness. Indeed, the range of social information provided via the telecommunications infrastructure encompasses the mundane and the critical, from the hours that a movie is playing and the location of the evening's party, to the call for a fire truck or police car. Neither should we think of the network as solely bound by the limits of telephony. In the social sphere, for example, television is a key medium, where most people receive their news and attend to the debate of social issues (big or small). In fact, chitchat among friends often focuses on television programming.

Access to communication services also offers benefits in a broader cultural sense. If the nation wants to encourage the sense of shared values and mutual responsibility that comes from social interaction, then maximum access to communication networks becomes a necessity. Social

interaction forms a part of the process through which society seeks to engender loyalty to itself and prevent deviant behaviors. We define ourselves not in isolation but through contact with others. Therefore, the network is an essential ingredient for overcoming social fragmentation and, consequently, for enabling participation in community.

Universal service, then, is an operational benchmark on the way to the greater goals of political participation, economic development, and social empowerment. When society experiences the benefits of access, it saves more lives, creates more jobs, and offers the chance to pursue the full spectrum of life to every citizen. Telecommunications policy should serve to connect all Americans to each other and to the rest of the world; for, in an information society, the network is the weave that helps us define ourselves and holds us together.

B. Lessons Learned from Consumer Behavior

The premise of this essay, that people should choose for themselves the configuration of service options that best suits their particular needs, stems from findings of a decade of research into the characteristics of households without telephones and the causes of their circumstances. Academic scholars, corporate investigators, researchers at the National Telecommunications and Information Administration (NTIA), and at the FCC, have contributed a body of data remarkably consistent but chock full of fascinating details. We emphasize telephone access findings because they form the largest body of comprehensive long-term data available for any information technology (By contrast, research on PC penetration and Internet subscribership is spottier, and almost entirely limited to marketing-like surveys of the last two years.). When that data are summarized, the principle findings make the case for exploring new Universal Service possibilities.

Despite the importance basic communications services, approximately 6 % of households in the United States still do not have access to a telephone (Telephone service first became available in 1877.). Moreover, considerable variation in telephone penetration rates exists among the states, from a low of 86.2% in New Mexico to a high of 97.5% in Pennsylvania.

Household income is a major factor contributing to lack of

access but should be understood as modified by other factors. African-Americans, Hispanics, single mothers, the presence of children, age, and marital status contribute to current telephone penetration gaps. Different telephone penetration levels persist among ethnic groups, even within the same income level. So many identifiable constituents influence lack of access that one may infer a complex set of choices for many households.

Geography influences the existence of information technology gaps. Even within a state, large variations emerge across counties. Indeed, local circumstances may well be the most important contributors to the existence of information technology gaps, the telephone gap in particular.

For most low income households, gaining access is not the most significant problem they face; managing toll charges tends to be more important. Maintenance of local service depends on the ability to pay for tolled charges. When households lose local service as a result of failure to pay for long-distance calls, they also lose connection to their communities, with uniformly negative consequences. The key to high telephone penetration levels appears to be separation of local from long-distance bills.

Some lower income households are high consumers of enhanced telephone services and cable. This is especially true for African Americans. Furthermore, these same households are often early adopters of these services; and, therefore, contribute to the diffusion of new technologies and services, in effect subsidizing later adopters.

Information goods requiring one-time only payments—e.g. radio, television, and personal computers—diffuse more rapidly than information services requiring monthly payment fees such as telephone, cable, and the Internet. In addition, variations in payment options have been shown to improve penetration levels for telephone service; other telecommunications services are probably no different. Thus, some keys to improving public access are located in the nature of the exchange between consumer and producer — pricing strategies make a difference.

Some information technology gaps have persisted with maddening tenacity but that is not true for all. For instance, though males once comprised the vast majority of

all Internet and World Wide Web (WWW) users, women now constitute the majority of new users and have a much higher PC adoption rate than men. Recent surveys suggest women will be the majority of all Internet users by a slim margin as early as 2002, mirroring their proportion of the total population. Also, Hispanic households appear to outpace all other ethnic groups in the purchase of PCs; they have doubled the number of computers in their homes in the last four years and are joining online services faster than the national average. By contrast, the gap between minority and majority telephone penetration continues to persist after twenty years of monitoring.

Household uses of new technologies vary widely with no simple patterns emerging. The remarkable creativity exhibited by individuals as they construct seamless information environments in their homes suggests humility when making predictions.

When these disparate data are integrated into a larger picture, one conclusion stands out. The number of households at the edge of the information infrastructure is likely to remain large; yet, any universal service policy must aim at bringing as many households as possible onto the network or risk the political, economic, and social costs to society associated with a large marginalized population.

C. Toward a New Theory of Universal Service

1. Underlying values

Every policy, public or corporate, assumes a set of values that often go unarticulated by policymakers themselves. And, just as with an individual's values, contradictions may be present because of the desire for multiple goals. A policy's underlying values, nevertheless, reflect the beliefs of its supporters, as well as their aspirations. With that in mind, any universal service policy should aim to reconcile the following values:

Democratic Participation. For citizens to participate as an informed public, they must have access to the information necessary for democratic, economic and social participation.

Universality. The information infrastructure must offer

interconnectedness as an opportunity to all Americans. Interconnectedness for all Americans must be reached within a reasonable length of time.

Affordability. Access to the information infrastructure must fall within the means of all Americans.

Interactivity. Americans have begun the transition to an interactive technological environment in the home. Therefore, universal service policy should promote interactivity, for audio and video, as a basic technological standard.

Personal Choice. A basic American value and a reality of the information society, individual selection among available access technologies and information services should be promoted.

Improvement. Any new broad social policy must lead the way to a better quality of life.

Inclusiveness. A universal service policy should be inclusive of technologies and services, in order to maximize choice.

Continuity. The existing domestic electronic environment must be the technological foundation for further developments. Compatibility between new and old technologies assures that no one will be left behind by simply holding on to an existing technological mix.

2. Goals

What should Universal Service accomplish in the Information Age? In an era of revolutionary technological change, the prize remains fixed if elusive -- to achieve the ideal of a democracy where all enjoy the opportunity of access so that all may participate. However, to keep one's eye on the prize requires a set of less abstract goals against which to measure our progress. That is, to meet the ideal, we must:

Maximize people's opportunity to access information for purposes of democratic participation, and the improvement of economic potential;

Maximize free and open communication among the largest

number of people;

Realize the potential of the evolving information environments in which Americans increasingly live;

Enable people to take reasonable actions to maintain their access to the network access; and

Maximize people's choice of services and channels included to enable individuals to create the information environment they think best meets their needs.

Adapt to the demographic changes taking place in American society.

If these goals seem redundant, they should. Because the prize is challenging and complex; it will take overlapping goals to earn the prize.

3. Operational Objectives

Reaching these new universal service policy goals requires operationalizing goals into actions. The components of such a program must include:

Define the universal bundle to incorporate cable television, e-mail, and the Internet.

Develop a menu of services to reflect the expanded bundle.

Enable individuals to select from the menu a combination of services that best meet their needs.

Allow users to change service selections within a reasonable amount of time.

Identify the individual as the basic unit of service, rather than the household.

Guarantee that an individual will maintain access to local services even if that individual cannot pay the fee-based charges, such as long distance service.

Monitor levels of access for specific groups, in order to maximize the opportunity for all to participate.

From these operational objectives, benchmarks can be

established to measure progress toward the prize.

4. Outcomes

Ultimately, every outcome lends itself to multiple measures. Projected outcomes must be sufficiently diverse so as to allow for an appreciation of the policy's broad success or failure; but they must also contain specificity so as to allow for multiple measures of evaluation. If the ICM is implemented broadly and consistently, it will produce the following measurable outcomes.

Greater access to the total network, not just to local telephone service;

Increased political participation;

Increased commercial activity and greater earnings;

Enhanced labor force participation;

Greater interconnectedness;

Expanded development and adoption of new technologies;

Increased learning, both formal and informal;

Enhanced personal security;

Improved public health; and,

Development of innovative network uses.

D. An Informed Choice Model (ICM) of Advanced Universal Service

In the past, Americans supported regulation of communications media as a method for bringing order and structure to the information environment of a particular technology. This was seen as advancing an undefined societal good. In this view, universal service simply represented the intent to wire the nation. To think otherwise was unimaginable; but times have changed. Americans increasingly rely on media even as they build ever denser information technology environments in their homes. Yet though policy makers wear the mantle of

convergence as they prepare for the future, the emerging picture of the home is not one of convergence; rather, the immense variations in resources available to Americans lead to conditions that diverge across factors of income, demographics, gender, and geography. A new universal service policy must respond effectively to this tendency.

Open Competition and Choice.

In principle, any entity wishing to offer a basic bundle of services should be free to enter the market. Consumers should enjoy the widest possible range of choices, in order to maximize the value of access configurations to themselves. Clearly, if the goal is to meet the needs of individuals, as they themselves perceive these needs, then individuals must be able to choose among differentiated offerings. The value of choice notwithstanding, open competition as a proposal raises some interesting questions.

Will open competition guarantee service to poor, rural, and/or minority households? In theory, someone will want to serve every segment of the greater market because there are profits to be gained from each segment. In practice, corporate strategists are just people, with cultural assumptions and blind spots. The rush among telecommunications providers of the last few years to serve business and upscale household markets indicates that market segments will receive varying attention from vendors. And, even though evidence suggests that minority households are higher consumers of advanced telephone and premier cable services than comparable white households, telecommunications marketers still tend to prefer white consumers. On the other hand, deregulation enthusiasts will assure policy makers that, left alone, providers will get around to serving "marginal" market segments once the highly profitable "core" segments have been developed. They will suggest that emerging telecommunications markets will parallel the diffusion of television; where, today, everyone who wants one has one. All the same, that 20 million Americans remain without telephone service in the 124th year of telephone history should counter beliefs that service to all is inevitable. We strongly suggest that the element of open competition as we propose it in this model will integrate a basic service across technologies and establish the basis for meeting a greater range of individual needs; but it will not, in and of itself, reach

out to all segments of society. The FCC and public utilities commissions (PUCs) will have to continue existing discussions aimed at meeting the needs of under-served populations, all are to experience choice.

Bundled Services.

Universal Service, as the enabling of basic access, should allow individuals to connect to the national network transparently across media. The bundling of telephone, broadband, and Internet services will enhance choice and enable consumers to configure telecommunications services for their own personal circumstances. Therefore, policymakers should encourage providers to offer as many different bundles as they wish, in order to add optimum value and pursue strategies of market segmentation.

Bundling services sounds fairly simple on the surface, but it raises a fundamental question: Who will choose the bundles? Let the market decide; we suggest that the FCC invite providers to offer as many bundles in as many configurations as they wish to bring to the market. Providers will instinctively offer numerous bundles to segment the market into consumer groupings that facilitate marketing appeals and bolster product loyalty. Given that market segmentation as a strategy is popularly understood in the business world, we can expect to see creative and aggressive bundling as providers jostle each other to dominate niches. Similarly, since American consumers behave with sophistication when selecting among competing products, we can expect to see consumers discriminating in their choices of bundles. The result should be the rapid discovery of niches; and, as a consequence, knowledge of who is being overlooked.

Protection of existing Universal Service Guarantees.

As a pledge against unintentionally widening access gaps, all bundles should be required to provide existing basic telephone service at a minimum (i.e., dial tone, directory assistance, emergency assistance, local and long-distance service). There is no merit in attempting an advance by losing ground. Therefore, citizens should expect the warranty that they will not lose existing basic universal services in the transition to an Advanced Universal Service regime. In this way, as Universal Service expands to embrace broadband and the Internet, it will build on its

traditional solid base.

Making a Priority of Local Considerations.

Agencies with an understanding of local conditions, such as state PUCs, should be encouraged to take the lead in assessing local needs, in order to identify specific access gaps and deficiencies. In recent years, it has been ascertained that telephone penetration varies dramatically at the local level. County by county variations are typical in most states, even when examining conditions for a single ethnic group or demographic category. The persistence of these findings challenges the notion that a single universal service policy offers the most effective delivery of access for all. Clearly, conditions faced by Navajos on their reservation in northern Arizona vary in substantive ways from conditions faced by Latinos residing in Phoenix, or even rural Latinos in South Texas. Furthermore, we may confidently infer that Navajos and Latinos will organize their choices according to different priorities. If one considers that variations such as these occur across the United States in combinations we have yet to understand, then one can appreciate the importance of an Advanced Universal Service policy that emphasizes choice and offers as many options as is reasonably possible. And, for those choices to be meaningful, Advanced Universal Service deliberations should include state entities as part of the discourse.

In the past, it has been common to think of policies as statements whereby governments brought order and structure to the information environment of a particular technology. Under the old concept, universal service simply represented an intent to wire a nation. Now, we suggest that the welfare of the American people will be more efficiently achieved if people are free to choose the configuration of their own access. Thus the key to an effective universal service paradigm—one that can double as an effective business strategy—is to provide a menu of technology and payment choices to potential customers. By moving away from the static notion of universal service and toward a dynamic informed choice model, we can initiate a reconceptualization of universal service for the next century.

II. Regulatory Challenges: When Technologies Converge

A. The Changing Universal Telecommunications Mission

New technological innovations and the diversification of service options complicate the longstanding public policy objective of achieving affordable and ubiquitous access to telecommunications services. Now, technological convergence makes it possible for a single service provider to offer a package of mixed services that heretofore have triggered different regulatory burdens because of their perception as mutually exclusive media. As a result, legislators and regulators experience greater difficulty in maintaining a "level competitive playing field" among telecommunications and information service providers and still pursuing universal service objectives -- especially when those objectives go beyond the traditional goals of bringing dial tone to the hinterland and making telephone service affordable everywhere.

B. Technological Convergence Undermines the Existing Regulatory Regime and Threatens Universal Service Funding

Regulatory dichotomies work best when technological categories remain discrete and absolute, as in current perceived distinctions between broadcasting and broadband. But they surely do not work when technological convergence results in porous service categories and diversification by operators. When cable, telephone, and Internet Service Providers (ISPs) offer telephone services functionally similar to those offered by telephone companies, regulators find it difficult to maintain that preexisting dichotomies reflect real world circumstances. This is particularly so when existing regulations inadvertently favor one type of technology and company over others. When ISPs offer consumers telephone service equivalents, which link PSTN access with Internet-mediated telephony, preexisting regulatory exemptions tilt the competitive playing field to their advantage.

C. Common Carriage Before the Internet and Enhanced Services

In the pre-convergence age, a single regulatory structure for telecommunications meant simply extending the public utility model of common carriage dating back to the railroads of the 1870s. The rights and responsibilities historically vested in common carriers ensured widespread access to essential services, established consumer

safeguards and tempered the anti competitive tendencies created when regulators authorized a single "natural monopoly" to operate -- Colloquially, telephone monopolist AT&T became known as "Ma Bell." On the one hand, government provided insulation from competition as well as from criminal and civil liability; in exchange Ma Bell agreed to regulation of prices, revenues, and other aspects of its corporate and operational behavior.

Historically, neither railroad nor telephone service providers were held responsible for content carried, nor could they refuse access to their bottleneck facilities on the basis of content, or customer location (The saying, "On the Internet no one knows you're a dog," has its roots in common carriage). Government could and did require the telecommunications common carrier to provide service to anyone ready, willing, and able to take service within a franchised geographical area. Moreover, common carriers could not discriminate among "similarly situated" users; meaning, in effect, that regulators calculated carrier costs and imposed profit margins. Common carrier pricing varied within narrow limits. By contrast, non-common carriers could operate as any private carrier when transporting content, whether it be over spectrum (e.g., satellite operators), or over closed circuit media (e.g., cable television operators). Their regulatory status derived from the perception that they lacked market power and did not provide essential or irreplaceable services.

However, in the last ten years, the dichotomy between common carriers and private carriers has grown murky, as a result of four pervasive tendencies:

legislative and regulatory tinkering with the common carrier model,

technological innovations,

a growing body of cases articulating robust First Amendment speaker rights for common carriers, and

court cases imposing quasi-common carrier obligations on private carriers

The resulting blurring of boundaries between common and private carriers makes it increasingly difficult for regulators to distinguish traditional common carrier

requirements when broadband and internet providers offer functionally equivalent service but bear no equivalent obligations. Neither legislators nor regulators have considered the services of private carriers so essential that they should participate in the universal service mission. Increasingly, however, private carriers offer new and competitive alternatives to basic service, such as wireless or satellite telephone services.

D. Common Carriers at a Disadvantage.

Since the last mile of universal service delivery occurs on the fringes of the market among poor or isolated households, incumbent common carriers are not likely to pursue universal service objectives when confronting the pressures of a competitive marketplace. The incumbents, who are Baby Bell spin-offs of the breakup of AT&T, must operate under common carrier regulations while upstart market entrants incur few or no regulations. When incumbents compete, they do so by reducing prices, cross-subsidizing services, introducing new products, and reallocating infrastructure investments, in order to meet the competitive threat where it occurs. In the rough and tumble world of competitive telecommunications, households at the margins tend to get overlooked.

Common carrier regulations applied to telephony, broadband, and Internet, can serve to meet universal service objectives when some degree of insulation from competition and liability can be balanced against a carrier's commitment to serve unprofitable locales and customers in need. When some service providers are exempted from common carrier obligations but can still offer functionally equivalent services, they place incumbent common carriers at a competitive disadvantage. Common carriers remain the carriers of last resort for unprofitable services, even as they must compete with new entrants free from obligations. That new entrants predictably target large volume business users in cities means that incumbent common carriers tend to lose out in their most lucrative markets but go it alone when providing access to marginal populations. Yet meeting the needs of marginal populations offers the greatest benefit to democracy by guaranteeing access to all, something that should be an obligation of every carrier.

E. Maintaining an Uneven Regulatory Playing Field

The view from the FCC sees a different set of priorities. The Commission has tentatively concluded that carriers such as Internet Service Providers (ISPs) should not be subject to access charges as currently constituted; that is, that enhanced and Internet service providers should only have to pay business local service rates. The FCC has chosen to consider the issue in terms of how to "provide incentives for investment and innovation in the underlying networks that support the Internet and other information services" rather than as a matter of whether enhanced and Internet service providers should pay access charges. Nevertheless, despite not having to contribute to universal service funding, ISPs can indirectly receive financial support when offering information services to schools, libraries, hospitals and clinics. While ISPs do not qualify for direct universal service subsidies as telecommunications carriers, they offer "advanced services" which the drafters of the '96 Act sought to make available to schools, etc. on a discounted basis. In essence, ISPs can have their cake and eat it too.

F. Universal Service Needs a New Regulatory Framework

Unofficially at least the FCC has expressed its confidence that marketplace incentives will provide the capital, technologies and services necessary to achieve universal access to information superhighways. But will it? The widespread availability of multiple ISPs throughout the nation, the trend toward distance insensitivity in telecommunications and information services, plus the long-standing tendency for ventures to offer nationally averaged, "postalized" rates would seem to answer yes. However, a fundamental question remains unanswered: have the millions of dollars already invested in universal service contributed to the these three factors, and conversely would a change in the level of available funds cause telecommunications carriers to change their pricing policies in a manner detrimental to ubiquitous access? More specifically:

Are there scenarios where the number of ISPs in rural and high cost areas might decline if their cost of doing business, e.g., network access costs, increased significantly?

Are first and last mile access services distance insensitive and will they remain so with new technologies

that have service limits based on proximity to switching facilities?

Under what circumstances will carriers de-average rates thereby eliminating one-price, postalized services?

Will state regulatory agencies authorize additional telecommunications service providers, including cellular radio operators, to maximize the benefits of universal service subsidies?

As the Internet matures and commercializes, current promotional access pricing and interconnection arrangements will change. Internet interconnection arrangements have become more hierarchical with zero cost peering now primarily limited to large volume, Tier-1 backbone carriers. Lesser ISPs now must pay larger carriers for access to their backbone networks, which is a perfectly reasonable response to the proliferation of ISPs, including many small ventures who would become free riders on larger carriers.

However, the potential exists for a more hierarchical Internet to balkanize networks and to impose higher costs on rural ISPs and those incurring the higher access charges. The Internet would surely balkanize if more network operators refuse to interconnect with other operators, even if the smaller operator offered to pay for access. And, even in the absence of such balkanization, the diversification of Internet operator types probably means that most rural ISPs will fall into the lowest and smallest category, thereby obligating them to incur interconnection and access charges with just about every other ISP they access. Thus, depending on what the financial impact of higher telecommunications links costs, rural ISPs may have to raise rates to levels comparatively higher than rates available in urban locales.

Universal service support programs in telecommunications work to prevent such an outcome, but under the current regime only schools, libraries and health care facilities enjoy subsidized access to Internet service. At present, less than half of households enjoy Internet access; moreover, the diffusion rate is much slower than historic rates for radio and television. At to universal access, we're a long way away.

G. Convergence Needs a New Regulatory Framework

The onset of Internet-mediated services presents a regulatory challenge to governments, particularly those disinclined to treat Internet-mediated services as equivalents to services transmitted and delivered via traditional media. The juxtaposition of different regulatory regimes creates an asymmetry that has the potential for tilting the competitive playing field in favor of the less regulated service. To the extent that regulation can impose financial and operational burdens, the service provider subject to greater regulation typically suffers a competitive disadvantage vis a vis the less regulated operator. Consequently, if governments are to promote fairness and the public interest, they need compelling justifications for establishing different regulatory regimes in view of the potential for such asymmetry to impact the marketplace attractiveness of one service vis a vis others.

When ISPs offer consumers telephone service equivalents, which link PSTN access with Internet-mediated telephony, preexisting regulatory exemptions tilt the competitive playing field to their advantage. Should significant telephony traffic volumes migrate to routings exempt from universal service contribution requirement, the sum of funds available to achieve the universal service mission will decline. Ironically, the possibility that universal service funds will decline will occur just as many governments have articulated a broader and more ambitious universal service mission for all citizens to have access to both basic telephone service and advanced Internet services.

The universal service mission may suffer greatly if the FCC continues to apply the basic/enhanced service dichotomy coupled with the different regulatory treatment of common carrier versus private carriers. If the Internet becomes the predominant medium for telecommunications and information services as anticipated, then an increasing volume of traffic previously considered basic, common carrier services will transform into enhanced, private carrier services simply by shifting to the Internet. This transformation may appeal to deregulatory advocates, but two secondary impacts will have a substantial, adverse impact on the generation of funds for supporting the

universal service mission:

When ISPs offer functionally equivalent long distance services, their non-common carrier, enhanced services provider classification exempts them from paying access charges and contributing to universal service funding.

Incumbent carriers, fettered with a more onerous universal service burden as a result of asymmetrical regulation, will create new, enhanced service provider subsidiaries similarly exempt from universal service subsidy obligations, in order to avoid the universal service contribution.

Few consumers understand or appreciate new charges on their long distance bills listed as a "universal service charge." At the same time as long distance telephone bills from conventional carriers contain new charges, new Internet telephony services provide substantial savings, due to exemptions from access charge and universal service funding. Clearly, part of the solution for minimizing, stabilizing and rationalizing universal service subsidization lies in spreading the financial burden across all providers of long distance telephone services, no matter what the medium.

Economic Challenges: Avoiding the Coming Crisis in Universal Service Funding

A. From the Telecommunications Act of 1996 to just,
Reasonable and Affordable Service

1. Objectives

The Telecommunications Act of 1996 represents the first comprehensive revision of the country's communications laws since the Roosevelt administration more than 60 years ago. Three important themes run through this legislation. First, the Act attempts to facilitate the benefits of competition. Second, and equally, the Act seeks to ensure that all Americans will share in the benefits of the telecommunications revolution by promising access to comparable services at comparable rates. Third, it endeavors to eliminate or reduce unnecessary and counterproductive regulations. Taken together, Congress envisioned delivering these benefits to business and residential markets, to rich and poor communities, to

cities, suburbs, and rural areas. Rates for telecommunications services should be "just, reasonable, and affordable," advanced services should be available everywhere, and rates should be about the same for rural, high cost locales as for urban areas.

Worthy though they may be, these goals create a conundrum for policy, for the ordinary workings of the market will not produce the outcomes desired by Congress. Where the cost of serving a community is higher, or where consumers' ability to pay is lower, those markets for services will not likely attract competitive vendors, since both situations threaten to diminish profits. How, then, will Congress achieve universal service goals while promoting competition? Congress' answer, rooted in 60 years of experience, is to subsidize competition where the potential for service lags behind more easily served areas, and do so through universal service subsidies be financed by "contributions" from telecommunications companies. The cross subsidy scheme balances high cost areas against low cost areas; that is, some consumers somewhere will pay above local cost, so that other consumers somewhere else can pay below local cost. In effect, this policy reflects a Congressional affirmation of belief in positive network externalities and traditional American egalitarian fundamentals like universal schooling, literacy or voting rights - in other words, democratic values.

Congress wants more competition, expanded universal service, comparable prices nationwide, and fairness for everyone. Don't laugh, this is what we all want. Competition has always been a goal, the issue has been to find the margins beyond which market forces do not function well. As for universal service, we need it as much today as we did in the gloomy 1930s when the first act was passed. The Congressional mandate to introduce competition, and the redistributive nature of universal service requires the FCC to take a multi-pronged approach if the mechanics of telecommunications regulation are to maximize access. If the FCC is to foster competition, then it must insure that the competitors treat each other fairly. Among the carriers, the FCC must adjust the cost of connectivity between local and inter-exchange carriers to reflect actual costs, and then require local exchange carriers to allow competitors to interconnect to their systems and lease their facilities at prices and on terms that will allow them to be competitive. In turn, the FCC

must create a separate mechanism for sizing, collecting and distributing universal service contributions in a fair and balanced way, if carriers are to be compensated for offering service to high cost areas. The "'96 Act" does not simply say: "Maintain universal service". Rather, the Act decrees that universal service must be "preserved and advanced" sufficiently to support an "evolving level of service" through new technologies. The Act intends for universal service to act as a driving force for investment in the new generation of service - not a constraining system looking backward to yesterday's technology.

Given Congress' goals, national policy needs to create redistributive structures that distort markets as little as possible while serving those who might otherwise be unserved or underserved. To fund these programs, Congress has mandated an expanded program of "contributions" based on a percentage of telecommunications carriers' gross revenues, thus hoping to avoid the vagaries of annual Congressional funding debates. Happily, this is a principle that can easily expand to include all participants who provide "advanced services."

2. Definitions for an Evolving Level of Universal Service

Section 254 (d) of the Act defines "Universal Service" as:
(A)n evolving level of telecommunications services that the Commission shall establish periodically, taking into account advances in telecommunications and information technologies and services. The Joint Universal Service Board and the Commission must consider the extent to which such telecommunications services:

Are essential to education, public health, or public safety,

Have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers,

Are being deployed in public telecommunications networks by telecommunications carriers, and

Are consistent with the public interest, convenience and necessity.

The current basic package of essential services to include: 1. voice grade access to the public telephone network, with the ability to place and receive calls; 2) touch-tone service; 3) single-party service; 4) access to emergency services, including 911 and Enhanced 911 (which identifies a caller's location); 5) access to operator services; 6) access to interexchange services; 7) access to directory assistance; and 8) Lifeline and Link Up services for qualifying low-income customers.

The Act mandates that the FCC periodically review which communications services should be included in universal service support. At the same time, states are free to establish their own definitions that go beyond federal ones. Even the states that have established the most expansive definitions have not required discounted rates for much beyond basic telephone service; they simply have defined basic services to include touch-tone dialing, access to long-distance carriers, and 911 services.

3. Implementation: The Universal Service Fund

The Universal Service Fund (USF) was established in 1983 to ensure that all Americans could afford telephone service wherever they live. The USF compensates telecommunications companies (not telecommunications users) that provide service to low-income communities as well as to rural areas where the cost of providing service is high. The Telecommunications Act of 1996 further mandates that the universal service fund provide support for schools, libraries and rural health care providers, generally known as the e-rate. Consumers see these monthly charges for universal service as a separate line item on their monthly bills, assessed by their long-distance carrier. Consumers also see a separate fee from their local phone company, averaging about 36 cents, similarly assessed to keep phone service affordable. To promote competition for these funds, the FCC has ruled that any telecommunications carrier, regardless of the technology it uses, may receive universal service support. However, as recommended by the Joint Board, a telecommunications carrier must meet three criteria to be eligible:

It must offer each of the designated services in the basic package.

It must offer the services using its own facilities, or a

combination of its own facilities and the resale of services provided by another carrier.

It must advertise the availability of and charges for the services; the states designate carriers eligible to receive support in part by establishing guidelines for carriers in regards to advertising.

4. Support for Linking High-Cost Communities

The economic reality is that some areas (and states) cost more to serve than others. In these cases, public policy arguments in favor of serving all comparably, if not identically, overtake the desire to let market forces prevail. Consequently, one can best understand the universal service high-cost support program as a series of political balances, atop a public policy intended to subsidize poor rural dwellers. In practice, the high-cost support program is an infrastructure support program designed to bring service to certain areas, whether those who dwell in them are rich, poor, or in between. Thus, as it now stands, the urban poor - to take a worst-case example - inevitably pay higher bills to underwrite the rich rancher or ski chalet owner. Were the FCC to abandon support for high-cost areas some areas might experience substantially higher costs of local phone service. It may be that a whole new mostly wireless industry aimed at supplying rural communications service is emerging. For now, though wireless solutions in rural telecommunications offer many opportunities, innovative wired solutions also hold promise and should continue to receive support.

5. Support for Linking Low Income Communities

Congress has also provided support for low-income consumers. The '96 Act strengthens two programs designed to keep basic telephone service affordable for low-income families: "Lifeline," which reduces monthly charges; and, "Link-Up America" which reduces initial connection charges. At present, Lifeline and Link-up America discounts for low income residents apply only to home phone service, and not to new telecommunications services such as the Internet. Note that unlike high-cost support, qualification for the low-income support programs involves means testing.

The '96 Act introduced the term "affordable" to national telecommunications policy: it mandates that quality

services should be available at "just, reasonable, and affordable rates," leaving it to the Joint Board and the FCC to determine what an "affordable" rate is. Both agree that:

the definition of affordable contains both an absolute component ("to have enough or the means for") and a relative component ("to bear the cost of without serious detriment").

Defining affordability as relative provides the flexibility to ensure that future iterations of universal service can avail themselves of a permanent mechanism for adjusting to changing conditions. (The states, according to the FCC, are the "appropriate fora" for measuring affordability.) The '96 Act also says charges should be "reasonable." Does "reasonable" mean below market? Not necessarily. The Supreme Court, interpreting the Sherman Antitrust Act's prohibition against price fixing, has argued that the only reasonable price is a competitive price.

a. The Lifeline Support Program Supports Rates

The new rules make the contribution and distribution of low-income support competitively and technologically neutral by requiring all providers of interstate telecommunications services to contribute, and allowing all Eligible Telecommunications Carriers, including wireless carriers, to receive support for offering Lifeline and Link Up service. From January 1999 through April 2000, the Lifeline Program distributed \$437,001,327.

Each Lifeline consumer receives \$5.25 per month in federal support; \$3.50 is automatic, while an additional \$1.75 in Federal support becomes available with state consent. In the full discount scenario, for every \$3 a consumer sees in rate reduction, the state contributes only \$1 -- and all of these funds remain in state.

b. Link-Up America: Supports Connectivity

Link-up America attempts to reduce the entry barrier for new low-income subscribers by paying half the cost of telephone installation and connection charges, up to \$30. Though participants must qualify under a state-determined means test, the state is not required to contribute to the reduction of hookup costs. A second part of the program

covers the interest charges for any deferred payment plan on installation and startup costs that the telephone company provides (within specified limits). From January 1999 through April 2000, the Link-up program distributed \$34,012,031. In states that do not have a state program, consumers must participate in one of the following programs to qualify: Medicaid, Food Stamps, Supplemental Security Income, Federal Housing Assistance and Low Income Energy Assistance Program.

Low-income consumers may choose any qualified carrier using any technology to provide basic service. They receive free toll blocking and toll limitation services and will not lose basic telephone service if unable to pay for toll charges. Moreover, There is no restriction on the number of service connections per year for which a low-income consumer can receive Link-Up support.

5. Schools, Libraries, Rural Health Care and the E-Rate

a. Schools and Libraries

The idea of an evolving universal service, introduced in 1994, opened the door to consideration of other beneficiaries of universal service beyond households; in that spirit, the '96 Act attached support for schools (K-12), libraries and rural health care facilities. However, the Schools and Libraries Universal Service Program, known as the "e-rate," differs fundamentally from Link-Up America and Lifeline. Funding under this provision, commonly called the "e-rate," is directed entirely at supporting "Advanced Services." That is, unlike traditional universal service, it does not seek to establish telephone connection per se; rather, it intends to provide "affordable" access to the Internet and broadband digital services. By identifying institutions as the target of the subsidy and by embracing advanced rather than basic services, it sets an important precedent.

Funded at up to \$2.25 billion annually, the Program provides discounts of 20% to 90% on telecommunications services, Internet access and internal connections, depending on economic need and location. However, institutions must apply; and, once approved, they apply their discounts to telecommunications services, they pay the difference between the approved discount and market price out of their own budgets. Not surprisingly, the

Program's deepest discounts go to rural and inner-city communities. E-rate funding comes from mandatory contributions to the USF by all telecommunications companies (local and long-distance carriers, reseller, cellular, paging, other wireless and any other companies that interconnect with the switched network, but not currently Internet, on-line service nor cable telecommunications companies). To pay for the \$2.25 billion program, providers of interstate telecommunications services are assessed 0.57% of their intrastate, interstate, and international end-user revenues, in addition to the 3.05% assessment that goes to support the high-cost and low-income subscriber universal service programs.

b. Rural Health Care Support

Rural health care support represents yet another area of support and yet another support mechanism. The catalyst comes from the convergence of medicine and telecommunications into "telemedicine" applications of particular value to rural and isolated populations. This program requires telecommunications providers to supply services to public and nonprofit health care providers serving rural residents, and must do so at rates reasonably comparable to rates charged to health care providers in urban areas. The FCC's rules provide for total support not to exceed an annual cap of \$400 million.

6. The Fork in the Road

For the time being, the current universal service funding program creaks along despite some serious internal contradictions that are mostly addressed by the FCC and the courts on an ad hoc basis. However, the internal tensions of the current provisions pale when compared to the leap necessary in order to extend the universal service regime from basic to advanced services, which is what Congress has directed. Telecommunications contains a substantial history of regulatory and economic policy structures that must be transformed. Still, the present framework for distribution of funds through high cost infrastructure compensation and low-income support can be adapted - in ways foreshadowed by the E-rate - to accommodate the new vision of advanced universal service; and, may be done incrementally, as both markets and regulatory models evolve.

For the most part, such a path does not warrant radical re-imagining of the finance mechanism, though it will require both the FCC and Congress to renew their thinking about the roles of the corporate players who currently pay, and those who don't. In this regard, ISPs present a special problem. As long as they are in the value/payment chain for an end-user's access to the Internet, or add costs to the network, or benefit from universal service funds, they should contribute. Nevertheless, a distinction should be made between an ISP's role as a content provider and as an access service provider; and, since no precedent exists for asking content providers to contribute to universal service funds, we make no recommendation here beyond the suggestion that exploration of the issue is warranted. To pursue the question to its logical conclusion will require a new level of policy thinking about the "content" of universal service.

At present, the universal service fund for high cost/low income support is collected from mandatory contributions by all interstate telecommunications carriers; for the e-rate, contributions come from all telecommunications carriers providing service within a state. However, intrastate carriers, wireless companies (in most circumstances), cable modem services, ISPs, and content services remain free of obligations. Under the model proposed here, all carriers or entities that can provide the necessary functionalities should be eligible for universal service subsidies. Correspondingly, all those eligible for funds should also contribute based on a percentage of gross revenues. This means expanding the program to include contributions from cable telecommunications and broadband services, as well as from digital wireless services and ISPs. This approach will be fairer and competitively neutral; and, since all who benefit also contribute, the contribution of any one entity will constitute a reasonable cost.

IV. Toward a "Universal Advanced Services Policy" and Affordable Access for All

The Telecommunications Act of 1996 took a giant step beyond regulatory constructs rooted in the 1930s. That it arrived with contradictory assumptions and unresolved issues should surprise no one; after all, making law is somewhat akin to making sausage. Now, however, we are summoned by the 21st century with the Information Age wrapped within it. If we are to achieve the ideal of access for all so that all may

participate so that democracy may thrive, then we must think beyond the horizon and imagine a telecommunications world different from our own yet recognizable. In this paper, we have described a universal service regime where an individual may choose as a basic bundle those services most suited to his or her needs; where a single regulatory regime governs all converged services; and, where financial support is equitably shared among providers. For Universal Service to meet the needs of citizens of the Information Age, policymakers will have to transform it into a policy for the Information Age. With that end in mind, we recommend an entirely new model - the Informed Choice Model - of universal service. We have built it around three basic assumptions.

1. Choice

A new universal service policy must respond effectively to changes in technology, in demography, and in information processing behavior. The basic structure of the Informed Choice Model of universal service contains for elements.

Open Competition and Choice.

Consumers should enjoy the widest possible range of choices, in order to maximize the value of access configurations to themselves; therefore, any provider wishing to offer a basic bundle of services should be free to enter the market.

Bundled Services.

Policymakers should encourage providers to offer as many different service bundles as they wish to place on the market. Bundling of telephone, broadband, and Internet services into basic service bundles will enhance choice and enable consumers to configure telecommunications services for their own personal circumstances.

Protection of existing Universal Service Guarantees.

As a pledge against unintentionally widening access gaps, all bundles should be required to provide existing basic telephone service at a minimum (i.e., dial tone, directory assistance, emergency assistance, local and long-distance service). Citizens should expect the warranty that they will not lose existing basic universal services in the

transition to an Advanced Universal Service regime. As Universal Service expands to embrace broadband and the Internet, it will build on its traditional solid base.

Making a Priority of Local Considerations.

Agencies with an understanding of local conditions, such as state PUCs, should take the lead in assessing local needs, in order to identify specific access gaps and inadequacies. The persistence of local variations in access challenges the notion that a single universal service policy offers the most effective delivery of access for all. The Informed Choice Model will advance the public interest by creating a framework within which people are free to choose the configuration that suites their access needs best.

2. Convergence

To recognize the consequences of the convergence of telephone, broadband, and Internet services and to correct disparities in contributions that currently exist between media, we should create and implement a single regulatory regime for all providers. In order to minimize, stabilize, and rationalize universal service subsidization the financial burden should be spread across all providers of long distance telephone services, no matter what the medium.

3. Reciprocity

All carriers that offer telecommunications services should qualify for universal service subsidies. Accordingly, those who qualify for the subsidies should also contribute to the Universal Service Fund, based on a percentage of gross revenues. To do so, requires expanding the Program to include contributions from broadband, wireless, and Internet service providers. Such an approach is fair and competitively neutral. All who benefit should also contribute.

The current universal service regime needs to move forward with a vision of where it is going. Clearly, there will be a transitional period during which additional legislation will be needed, and new regulations will be issued. As daunting as that prospect appears, to continue on the present path invites far more serious consequences. Much of Franklin D. Roosevelt's legacy has been transcended,

though one can find his imprint throughout telecommunications. And now, the presidential administration that wrote and signed the Telecommunications Act of 1996 has passed into history. A new administration must now grapple with the implications of telecommunications as a body of legislation, as forces in the marketplace, and as an essential ingredient for promoting democracy.

I.

To Connect a Nation: Convergence and Choice Toward a New
Theory of Universal Service
The Changing Universal Telecommunication Mission
When Technologies Converge

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The universal service mission in telecommunication 1 will change and evolve as technological innovations make it possible to offer faster, better, cheaper and smarter applications. Technologies like Asymmetric Digital Subscriber Links, cable modems, wideband satellite service and terrestrial broadband options provide high speed access to new information age services such as direct to the desktop computer, "streaming" video. Collectively these technologies trigger the transition from Plain Old Telephone Service ("POTS") to Pretty Amazing New Stuff ("PANS"). As well they offer the promise of enhancing productivity and quality of life, particularly if the Internet continues to evolve as a major medium for communications and commerce.

Technological innovations and the diversification of service options complicates the longstanding public policy objective of achieving affordable and ubiquitous access to telecommunications services. Currently the universal service mission for POTS costs approximately \$5 billion annually 2 and has become more irritating to some, because the funding method involves direct subsidization from long distance carriers and their customers who now see new charges on their monthly bills. At the same time as the POTS mission remains ongoing, Congress has expanded the universal service campaign to include specific "e-rate" beneficiaries, like schools and hospitals, and a mandate for access parity between urban and rural consumers for advanced PANS services.

An expanded and more costly universal service mission poses more daunting choices for consumers, but also greater challenges in shaping legislative and regulatory goals, strategies and policies. As the universal service mission cost rises, telecommunication service providers and their consumers have increasing incentives for finding ways

to avoid making universal service subsidy contributions. Technological innovations and regulatory classifications make this avoidance strategy more easily achieved as ventures can offer Internet-mediated long distance telephone services that qualify for exemptions from the local network access charges and universal service subsidies paid by long distance carriers.

Technological convergence makes it possible for a single service provider to offer a package of POTS and PANS services that heretofore have triggered different regulatory burdens. Legislators and regulators will have greater difficulty in maintaining a "level competitive playing field" among telecommunications and information service providers while also achieving universal service objectives no longer limited to the primary twin objectives of bringing dial tone to the hinterland and making telephone service affordable everywhere.

This paper will address the impacts on universal service resulting when different technologies converge and when pre-existing regulatory models fail to work properly. Technological innovation blends together previously discrete technologies, subject to a customized regulatory system. The resulting convergence does not lend itself to continued application of either preexisting regulatory systems. For example, both state and federal regulators traditionally deem local and long distance telephone service as common carriage: a public utility offering subject to significant economic regulation designed to achieve universal service on nondiscriminatory and cost-based terms.

On the other hand many of the enhanced services, which might become part of an expanded inventory of universal service elements, traditionally have qualified for unregulated or lightly regulated status. Congress, the FCC and state regulators collectively share the view that cable television and value-added information services do not constitute common carriage and accordingly do not fit into a pervasively regulated category like telephony.

Technological Convergence Ruins the Existing Regulatory Regime and Threatens Universal Service Funding System

When an ISP can provide long distance telephone services free of universal service funding contributions and regulation two adverse consequences result:

ISPs can exploit their unregulated status to provide long distance telephone service functionally like that offered by regulated carriers; by not having to pay fees borne by

competitors ISPs can offer cheaper service leading to a migration of long distance telephone traffic from routings that trigger a universal service funding contribution to ones that do not require such payments; and

2) In a broader sense the ISPs' ability to exploit their special unregulated status challenges the rationality of having two different classifications (private carriers providing enhanced, information services versus common carriers providing basic telecommunications services) when consumers perceive little difference between Internet-mediated and conventional long distance telephone service.

Regulatory dichotomies work only when technological categories remain discrete and absolute. But they surely do not work when technological convergence results in porous service categories and diversification by operators. When cable telephone and Internet Service Providers ("ISPs") offer telephone services functionally similar to what telephone companies, regulators cannot maintain preexisting dichotomies, particularly when regulations inadvertently have favored one type of technology and company over others. When ISPs offer consumers telephone service equivalents, which link PSTN access with Internet-mediated telephony, preexisting regulatory exemptions tilt the competitive playing field to their advantage. Should significant telephony traffic volumes migrate to routings exempt from the universal service contribution requirement, then the total funds available to achieve the universal service mission will decline. The potential for declining universal service funds occurs just as Congress has articulated a broader and more ambitious universal service mission and has expressly identified beneficiaries of this mission, viz., schools, libraries, hospitals, and clinics.

The Universal Service Mission

Ubiquitous and low cost access to basic telecommunication services constitute a fundamental public policy objective in the same vein as providing access to other basic infrastructure such as electricity and water. 3 "Telecommunications is not simply a connection between people, but a link in the chain of the development process itself." 4 A correlation exists between access to telecommunications facilities and services and economic development. 5 This means that efficient, effective and

widely available telecommunications can stimulate social and economic development by providing the vehicle for more and better commerce, political discourse, education, and job training.

In view of changing technologies and consumer expectations, the concepts of universal access and universal service remain in flux. As a baseline we should consider universal access and service in terms of four components:

1) Infrastructure-the scope and nature of the network that serve users;

2) Services-what constitutes basic "life-line" service and to what other features should users have access at an additional price?;

3) Cost-should users pay the full cost of service, or should some subset of the user base receive subsidies for non-recurring charges, such as installation, as well as for recurring charges, such as monthly service?; and

4) Maintenance and Upgrades-what incentives must regulators create to ensure that universal service providers maintain and upgrade their networks?

Access also includes the issue of physical proximity between individuals and the telecommunications infrastructure. Even in developed nations, some users must share telephone lines. In developing nations and rural or high cost areas, shared access from the home or a public place might have to suffice in the short run. One cannot conclude that an entire nation has access to a telecommunications infrastructure simply because a satellite footprint illuminates the country. On the other hand, significant progress in a universal service mission will occur when the first of only a few telephone lines become available in a locality. Accordingly, the first step in reaching the universal service mission may involve the provisioning of lines to public facilities, such as libraries, post offices, government buildings, schools and clinics.

The Status Quo Ante: Common Carriage Before the Internet and Enhanced Services

In this information age, buzz words like convergence, digital, multimedia, and interactive describe an

environment where technological innovations largely foreclose air tight legal and regulatory dichotomies. Until twenty years ago it was possible for judges and regulators to construct different rules and requirements based on the nature of the service and the characteristics of who provided the service. Something as apparently absolute as the First Amendment could apply differently as a function of the communication medium involved. For example, government could impose more burdensome restrictions on speech mediated through the public airwaves than through the spoken or written word.

In the pre-convergence age, a single regulatory structure for telecommunications could apply by extending the pre-existing public utility model of common carriage. The rights and responsibilities historically vested in common carriers ensured widespread access to essential services, established consumer safeguards and tempered the market power created when regulators authorized a single "natural monopoly" to operate. Governments negotiated a regulatory compact with common carriers: providing valuable insulation from competition and reduced liability or exemption from criminal and civil liability in exchange for agreeing to regulation of the prices charged, the revenues generated and many other aspects of the carrier's corporate and operational behavior.

Historically, providers of neutral and transparent conduits did not have to monitor the content carried, nor could they typically refuse access to their bottleneck facilities on the basis of content, or customer location. Government could require the telecommunications common carrier to provide service to anyone within a franchise geographical area ready, willing and able to take service. Common carriers could not discriminate among "similarly situated" users, meaning in application a limited capacity to price service as a function of demand and marketplace conditions, as opposed to a regulator-managed calculation of carrier costs and a fair rate of return.

On the other hand, non-common carriers could operate as private carriers when transporting content, whether over spectrum, e.g., satellite operators, or via closed circuit media, e.g., cable television operators. Their regulatory status derived from the perception that they lacked market power and did not provide essential or irreplaceable services.

The dichotomy between common carriers and private carriers has grown murky, because of:

- legislative and regulatory tinkering with the common

carrier model; 7

- technological innovations;
- a growing body of cases articulating robust First Amendment speaker rights of common carriers; and
- court cases imposing quasi-common carrier obligations on private carriers, e.g., the duty of cable television operators to carry broadcast television signals, and quasi-publisher duties on common carriers, e.g., the duty to inquire and disclose whether content is obscene or indecent.

A fuzzy line between common and private carriers makes it increasingly difficult for regulators to impose traditional common carrier requirements when ventures providing functionally equivalent service bear no such burdens. Legislators and regulators have not considered private carriers as providing such essential services that they should participate in the universal service mission, either as partial underwriters, e.g., payment of fees used to subsidize universal service, or as recipients of universal service subsidies. Increasingly, however, private carriers offer both competitive alternatives to basic service offered by regulated common carriers, e.g., wireless telephone services, and new services that legislators and the public believe should constitute a part of a revised and bolstered universal service mission.

Common Carriage and the Universal Service Mission

The common carrier regulatory regime makes it possible for policymakers to execute a universal service mission. Regulators can compel common carriers to provide undesirable or unprofitable service in two key ways:

- 1) regulators can impose costs on common carriers by forcing rate averaging and cross-subsidization as a necessary public interest dividend in exchange for the carrier's insulation from competition and some types of criminal and civil liability; and
- 2) regulators can more easily engineer a financial cross-subsidy mechanism for underwriting universal service programs when a single set of large ventures exist that can orchestrate the collection and distribution of universal service funds by adjusting service rates above and below actual cost, plus a reasonable return.

Telecommunications common carriers have accepted their status based on a rational cost/benefit analysis. They trade off upside profitability for protection from the downside of below market rates of return and open markets. While the regulator-granted franchise may not have expressly conferred market exclusivity, most telecommunications common carriers enjoyed monopoly status. Perhaps incumbent operators grew to expect exclusivity as part of the deal. Such expectations notwithstanding, the barriers to market entry have dropped, because of technological innovation and increased reluctance on the part of regulators to deny market entry opportunities. To make matters worse, market entrants typically operate with fewer regulatory burdens, including noncommon carrier status.

Incumbent common carriers' ability and inclination to pursue universal service objectives may decline in a competitive marketplace, particularly one with asymmetrical regulation, i.e., burdensome common carrier regulation of incumbents, and light or nonexistent regulation of market entrants. Incumbent operators may have to reduce rates for services, particularly in localities where they face competition. This competitive necessity would reduce internally generated revenues available for voluntary cross-subsidization of services not facing competition and downward rate pressure. Similarly, incumbent carriers may need to reallocate infrastructure investments to localities, e.g., cities where they have to match the diversified services available from new competitors. However, the common carrier classification may limit incumbent operators' ability to adjust rates in response to competition. Rate rebalancing has no net financial impact on the incumbent carrier's revenues or rate of return, but it typically results in reduced rates for competitive, urban services and raised rates for hinterland services. Such rebalancing comes across to rural residents as a discriminatory rate hike, and may have an adverse impact on universal service by making POTS and PANS more expensive in the absence of redirected or increased subsidies.

The common carrier classification best serves universal service objectives when regulators can leverage some degree of insulation from competition and liability in exchange for the carrier's commitment to serve unprofitable locales and customer categories. When noncommon carriers can offer functionally equivalent service, incumbent common carriers have legitimate concerns that they will remain the

carrier of last resort for unprofitable services even as they lose market share and revenues in having to compete with newcomers. Market entrants predictably target the most profitable and easiest to serve customers, typically large volume business users in cities.

Incumbent carriers consider this market strategy unfair "cherry picking" and "creamskimming." Regardless of whether it constitutes unfair competition, such selective targeting of customers has a possibly immediate and adverse impact on universal service for two reasons:

1) all universal service funding most likely will have to come from consumers, without any local exchange carrier voluntary cross-subsidies; this means consumers will incur higher charges indirectly through above cost access charge payments passed through by interexchange carriers, or directly through additional long distance charges; and

2) incumbent local exchange carriers will have increased incentives to deaverage rates, i.e., to seek permission to subdivide service territories, such as an entire state, into smaller service regions based on traffic density and degree of competition.

Where Does Internet Access Fit Into the Universal Service Mission?

The Internet means different things to different people. On a macro, technological level, it constitutes a "network of networks" in the sense that ISPs purposefully link their individual networks with other networks to achieve global connectivity. ISPs provide consumers with "seamless" access to most of the individual networks that comprise what we call the Internet often with a contract covering only the first or last of many network connections. The packet-switched nature of the Internet, coupled with switching and routing protocols, provides robust and diverse network access without each ISP having to negotiate interconnection terms with every other operator. Telecommunications carriers achieve similar connectivity with greater effort and specificity: the one-by-one accumulation of operating agreements.

Internet users benefit from the technological ease in switching and routing traffic, but such seamlessness generates a host of legal and regulatory problems. For example, the lack of contract privity between each and every ISP raises liability questions when an ISP

inadvertently provides a conduit for a criminal transaction, e.g., the transmission of obscenity, serving as the delivery mechanism for securities fraud, and providing the forum for predatory, libelous and other illegal behavior. The legal and regulatory models created for telecommunication carriers provide near absolute exculpation. As neutral and transparent common carriers, telecommunication service providers lack liability or culpability even when serving as the conduit for the commission of a crime. Conversely, ISPs do not operate as common carriers. They benefit by not incurring the duties of common carriers: to provide service to any and all users in a particular geographical region without discrimination.

Impact From The Telecommunications Act of 1996

Section 254 of the Telecommunications Act of 1996 (hereafter referred to as the '96 Act) amends the Communications Act of 1934 to establish an explicit mandate for the FCC to promote universal access to telecommunication services. 8 The legislation requires explicit universal service funding 9 and mandates equitable and non-discriminatory sharing of the financial burden among all telecommunications carriers providing interstate telecommunications services.10 The '96 Act also identified specific beneficiaries of the universal service mission: schools, health care provider facilities, and libraries. Additionally, the '96 Act directs the FCC and state commissions to promote in all regions of the nation 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." 11

The FCC, in consultation with State Public Utility Commissions, established six general universal service principles:

- Quality services should be available at just, reasonable, and affordable rates;
- Access to advanced services should be available in all regions of the nation;

- Access to basic and advanced services should be available to customers in rural and high cost areas and to low-income consumers at rates comparable to those in urban areas;

- Equitable and nondiscriminatory contributions should be made by all telecommunications providers to the preservation and advancement of universal service;

- Specific and predictable support mechanisms should exist at both the federal and state level; and
- Schools, health care facilities, and libraries should have access to advanced telecommunications services.

The FCC also determined that the following services warranted subsidization to achieve ubiquity:

voice grade access to the public switched network, with the ability to place and receive calls;

Dual Tone Multifrequency ("touch tone") signaling or its functional equivalent;

single-party service;

access to emergency services, including 911 and Enhanced 911 (which identifies a caller's location);

access to operator services;

access to interexchange services;

access to directory assistance; and

Lifeline and Link Up services for qualifying low-income consumers.

On the matter of telephone service affordability, the FCC accepted the recommendation of a Board comprised of both FCC and state public utility Commissioners that the states should monitor rates and non-rate factors, such as subscribership levels, to ensure local telephone service remains affordable. The FCC expanded the Lifeline program, which discounts local telephone service to qualifying users, and implemented the "e-rate" program that provides schools and libraries with discounted access to all commercially available telecommunications services, Internet access, and internal connections. Eligible schools will qualify for discounts ranging from 20% to 90%, with the higher discounts available to the most disadvantaged schools and libraries and to those in high cost areas. The Commission capped total expenditures for

universal service support for schools and libraries at \$2.25 billion per year, with a roll-over into following years of funding authority, if necessary, for funds not disbursed in any given year. Additionally all public and not-for-profit health care providers located in rural areas will receive universal service support, not to exceed an annual cap of \$400 million. A health care provider may obtain telecommunications service at a transmission capacity up to and including 1.544 megabits per second, the bandwidth equivalent of a T-1 line, at rates comparable to those paid for similar services in the nearest urban area with more than 50,000 residents, within the state in which the rural health care provider is located. Rural health care providers also will receive support for both distance-based charges and a toll-free connection to an ISP. Each health care provider that lacks toll-free access to an ISP may also receive the lesser of 30 hours of Internet access at local calling rates per month, or \$180 per month in toll charge credits for toll charges imposed for connecting to the Internet.

ISPs Exempted From Having to Pay Access Charges and USF Contributions

On the subject of ISP and other "enhanced service providers" the Commission noted that previously it exempted such ventures from paying access charges in addition to their ordinary line rental fees. In 1983, the FCC classified enhanced service providers as "end users" rather than "carriers" for purposes of the access charge rules. 12 The Commission tentatively concluded that ISPs should not be subject to access charges as currently constituted, i.e., that enhanced and Internet service providers should only have to pay business local service rates. However, the Commission did note that "usage continues to grow, [and that] such services may have an increasingly significant effect on the public switched network." 13

The FCC has chosen to consider the issue broadly in terms of how to "provide incentives for investment and innovation in the underlying networks that support the Internet and other information services" 14 rather than narrowly a matter of whether enhanced and Internet service providers should pay access charges. 15 With that perspective in mind, the Commission noted:

the development of the Internet and other information services raise many critical questions that go beyond the interstate access charge system that is the subject of this proceeding. Ultimately, these questions concern no less

than the future of the public switched telephone network in a world of digitalization and growing importance of data technologies. Our existing rules have been designed for traditional circuit-switched voice networks, and thus may hinder the development of emerging packet-switched data networks. To avoid this result, we must identify what FCC policies would best facilitate the development of the high-bandwidth data networks of the future, while preserving efficient incentives for investment and innovation in the underlying voice network. In particular, better empirical data are needed before we can make informed judgments in this area. 16

ISPs Can Qualify For Indirect Universal Service Subsidies

Despite not having to contribute to universal service funding, ISPs can indirectly receive financial support when offering information services to schools, libraries, hospitals and clinics. While ISPs do not qualify for direct universal service subsidies as telecommunications carriers, they offer "advanced services" which the drafters of the '96 Act sought to make available to schools, etc. on a discounted basis. 17 In essence ISPs can have their cake and eat it too. 18

The FCC initiated a Notice of Inquiry seeking comment generally on the implications of information services such as Internet access for the telephone network. The Commission asked what it should do to encourage development of packet switching hardware able to route data traffic around incumbent LEC switches, or to install new high-bandwidth access technologies such as asymmetric digital subscriber line ("ADSL"), or wireless solutions.19 Without directly addressing the issue of ISP exemptions and the impact on universal service the Commission has turned its attention to the broader issue of how to promote deployment of advanced services by telecommunications carriers. 20

Despite Misgivings, The FCC Maintains ISP Exemptions

In an April, 1998 Report to Congress, 21 the FCC strongly hinted its disinclination to maintain a blanket exemption of all types of Internet telephony from universal service funding obligations:

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. 22

While the FCC refrained from taking a definitive stance "in the absence of a more complete record focused on individual service offerings," 23 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," 24 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 telecommunications services and do so in a manner that exploits anomalies and loopholes thereby exempting them from universal service obligations and reducing the funds available for subsidizes. 25

The Definitions of Telecommunications and Information Service

The FCC reiterated its view that the Telecommunications Act of 1996 legislated a regulatory dichotomy between telecommunications and information services. Operators providing the former have a duty to contribute to universal service funding, but providers of the latter do not.

Unfortunately for the FCC such a clean semantic dichotomy cannot operate in a time of rapid technological evolution and convergence. Likewise, Congress ordered the FCC to consider the impact of mixed or hybrid services 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."26 However, the provision of transmission capacity to ISPs does constitute a "telecommunications service." 27 Presumably, any basic service routed via such capacity does not necessarily convert into "information services" simply because an "information service provider," as defined by the Telecommunications Act, 28 offers other information services perhaps transmitted over the same transmission capacity.

In its 1998 Report to Congress the FCC also acknowledged the view of Senators Burns and Stevens that regulatory mutual exclusivity cannot work for instances where a single enterprise provides both telecommunication and information services, or that a service combines aspects of both classifications. 29 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 ISPs 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." 30 Accordingly the Commission reiterated the need for an absolute regulatory dichotomy based on a functional analysis:

Internet Telephony as a Telecommunications Service

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 "phone-to-phone IP telephony" services bear the characteristics of "telecommunications services." 31 "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, 32 the market for Internet telephony has exploded, coupled with a real potential for significant migration of traffic from customary switching and routing, subject to access charges and USF contribution requirements, to Internet-mediated switching and routing heretofore exempt from access charges and USF contribution requirements.

For ventures meeting a four-part test, 33 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."
34

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." 35 The Commission did note that if it were to deem phone-to-phone, Internet-mediated telephony telecommunications, that finding 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, 36 permits the Commission to forbear from imposing any rule or requirement of the Communications Act on telecommunications carriers. 37 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. 38 ISPs Should Help Fund the Universal Service Mission

Section 254(d) of the Communications Act, as amended, mandates universal service contributions from "every telecommunications carrier that provides interstate telecommunications services." 39 In application the USF obligation has extended to wireless paging and telephone service providers, because they are providers of telecommunications service despite the limited use of the local loop and limited opportunity to receive financial support themselves. Some private telecommunication carriers also must make USF payments even though they operate as non-common carriers. 40 In its 1998 Report to Congress the FCC stated that its intention to "construe broadly the class of carriers that must contribute." 41 Likewise it recognized the potential for Internet-mediated telephone service to reduce universal service funding:

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. 42

A Predisposition Not to Extend Legacy Regulation

Notwithstanding the real potential for adverse financial impact on its universal service mission, the FCC remains adamantly opposed to extending traditional telecommunications regulation to ISPs. 43 The Commission believes market forces will create incentives for a robustly competitive and ubiquitous highspeed information service infrastructure. As well the FCC wants to support the Clinton Administration's view that the Internet should be a tax-free, largely unregulated media. 44

In a larger sense the FCC has unofficially expressed its reluctance to extend the common carrier classification and the regulatory burden its generates on Internet-mediated services, including ones that compete with, and appear as viable alternatives to common carrier services. The Commission appears disinclined to impose legacy regulations on new technologies even if these technologies migrate traffic and revenues from services that have borne the universal service subsidy obligation:

New technologies, while perhaps similar in appearance or in functionality, should not be stuffed into what may be ill-fitting regulatory categories in the name of regulation. Rather, the Commission should continue the approach of studying new technologies and only stepping in where the purpose for which the Commission was created, protecting the public interest, demands it.45

Staffers at the FCC's in-house think tank favors deregulating incumbents rather than regulating market entrants. The FCC should pay attention to the potential for anticompetitive conduct, and adverse impact on universal service funding. However, the Commission should decide to apply regulatory safeguards on an ad hoc, as needed basis and for instances where regulatory intervention outweighs the costs imposed.

Universal Service Cannot Fully Develop in an Unregulated Environment

Unofficially at least the FCC has expressed its confidence that marketplace resource allocation will adequately provide the capital, technologies and services necessary to achieve universal access to information

superhighways. Part of this misguided confidence appears to stem from the widespread availability of multiple ISPs throughout the nation, the trend toward distance insensitivity in telecommunications and information services and the long standing tendency for ventures to offer nationally averaged, "postalized" rates. However, a fundamental question remains unanswered: have the millions of dollars already invested in universal service contributed to the above three factors, and conversely would a change in the level of available funds cause telecommunications carriers to change their pricing policies in a manner detrimental to ubiquitous access? 46 More specifically:

- are there scenarios where the number of ISPs in rural and high cost areas might decline if their cost of doing business, e.g., network access costs, increased significantly?
- are first and last mile access services distance insensitive and will they remain so with new technologies like ADSL that have service limits based on proximity to switching facilities?
- under what circumstances will carriers deaverage rates thereby eliminating one-price, postalized services? and ,
- will state regulatory agencies authorize additional telecommunications service providers, including cellular radio operators, to maximize the benefits of universal service subsidies?

The Potential for Balkanization of the Internet and Its Impact on Universal Service

As the Internet matures and commercializes current promotional access pricing and interconnection arrangements will change. 47 During the Internet's initial incubation period, ISPs emphasized connectivity at the expense of a calibrated and efficient access and interconnection mechanism. During this time, network congestion did not present much of a problem and operators typically agreed to a zero cost "peering" arrangement with other operators. Having no apparent incentive to incur the cost to meter traffic flows, ISPs interconnected facilities on a Sender Keep All basis. Such an arrangement helped make the Internet "a network of networks" and as well expedited the accrual of positive networking externalities, i.e.,

expanding the value of the Internet as more users and content suppliers come on-line.

Internet interconnection arrangements have become more hierarchical with zero cost peering now primarily limited to large volume, Tier-1 backbone carriers. Lesser ISPs now must pay larger carriers for access to their backbone networks. This outcome constitutes a perfectly reasonable response to the proliferation of ISPs, including many small ventures who would become free riders of larger carrier facilities absent a transfer payment. As well, a payment mechanism helps reduce congestion, or at least imposes costs of carriers and their customers responsible for adding a traffic burden on another service provider.

However, the potential exists for a more hierarchical Internet to balkanize networks and to impose higher costs on rural ISPs and those incurring the higher access charges. The Internet might balkanize if more network operators refuse to peer and interconnect with other operators, even if the smaller operator offered to pay for access. Even in the absence of such balkanization, the diversification of Internet operator types probably means that most rural ISPs will fall into the lowest and smallest category thereby reducing their peering opportunities and obligating them to incur interconnection and access charges with just about every other ISP they access. Depending on what the financial impact of higher telecommunications link costs, rural ISPs may have to raise rates to levels comparatively higher than rates available in urban locales. Universal service support programs in telecommunications works to prevent such an outcome, but under the current regime only schools, libraries and health care facilities enjoy subsidized access to Internet service.

Distance and Volume Still Matters When Carriers Price Service and Set Access Terms

No doubt technological innovations in telecommunications and information processing support declining consumer costs. However distance and traffic volumes still matter in the cost calculus: a long call routing from a rural caller or Web surfer to a distant call recipient or content source costs more than a shorter or more easily routed call. In the telephony environment, carriers typically average dense and sparse route traffic costs, but a small, rural ISP may not have the traffic volume or a wide enough service territory to engage in similar cost averaging.

There is nothing new to the fact that rural or inner

city residents frequently face higher product and service costs. But arguably access to the Internet and other advanced services should qualify for the same preferred status as telephony. However, the USF mechanism cannot generate sufficient funds for such an expanded mission. Already the establishment of discounted e-rate access to telephony and the Internet has imposed substantial stress on the universal service contribution process with consumers objecting to a new tax when IXCs add a new line item to their bills to pass through explicit financial subsidy burdens. Billions more in universal service funding would be required if Congress expressly expanded the universal service mission to include Internet access beyond e-rate beneficiaries.

Rate Rebalancing Will Occur Despite Adverse Affects on Universal Service Goals

At the same time as rural ISPs incur higher telecommunications costs, all telephone service subscribers in rural and high cost areas face significantly higher rates. When ILECs face competition in urban areas, they rationally see the need to reduce rates and expand service options. Reduced urban service revenues will trigger the need to generate higher revenues elsewhere so that the carrier generates a fair total amount of revenues. One could consider such rate "rebalancing" as unfair in the sense that rural and high cost residents, even as they accrue the financial benefits of universal service funding, end up having to "subsidize" competitive rates available to large volume, urban users. But another way to look at this outcome is the appreciation that without a conscientious effort to meet competitors' prices, ILECs would lose urban and large volume customers. Should this occur, ILECs would have to rely even more so on the revenues generated when they operate as carriers of last and only resort to their "captive" customers who have no service alternative. Using universal service concerns as the basis for denying a rate rebalancing request might have the unfortunate effect of making matters worse for rural users in the long run.

Regulators Appear Reluctant to Support Alternative Carriers and Technologies to Achieve Universal Service Objectives

The Telecommunications Act of 1996 created a mechanism for state regulatory agencies to authorize more than one carrier to pursue universal service goals in a locality or region. 48 Heretofore states have been reluctant to certify additional carriers, including ones using wireless

technologies that can provide cost-effective service on an immediate basis, despite the FCC conclusion that "the plain language of section 214(e)(1) does not permit the [Commission] or the states to adopt additional criteria as prerequisites for designating carriers eligible" for universal service subsidization.⁴⁹

Perhaps such reluctance stems from the perception that authorizing multiple carriers to operate in a single region somehow would adversely affect the ability of the incumbent carrier to continue providing services in view of the potential for universal service fund diversion. If providing subsidized services has diverted time, money and effort from other more profitable endeavors, then ILECs should welcome the opportunity to share or abandon such a burden. In any event, no state or federal regulatory authority should second guess the business judgment of a new carrier ready, willing and able to provide essential, universal services.

Much of the cost incurred in providing wireless services occurs with the installation of the towers, antennas, switches and transmitters that constitute the infrastructure. The incremental cost of an additional minute of traffic anywhere within the overall "footprint" of a mobile radio system approaches zero, absent congestion. While a rural call may involve more switching and backhauling to a central facility, probably located in an urban locale, the mobile radio operator may be inclined to offer postalized rates throughout a service area, i.e., declining to impose higher "roaming" charges simply because the caller is located outside a city. It appears that many regulators have failed to notice the significant reduction in mobile radio charges and the ability of wireless services, in some circumstances, to offer functional equivalent service at roughly the same cost as conventional wireline options.⁵⁰ In any event, the criteria for determining whether to grant ETC status to a wireless carrier does not depend on the affordability or substitutability of wireless services vis a vis incumbent wireline carrier services.⁵¹

Convergence Requires a New Approach to Universal Service

In a converging and Internet-centric environment, preexisting regulatory classifications simply do not work. Technological convergence blurs the semantic classifications between print media, broadcasting, closed-circuit media like cable television and telephony. Market convergence means that previously discrete industry segments merge, or at least become more easily penetrated

by newcomers. For example, in an Internet-dominated environment, an ISP could easily become a "one-stop-shop" for consumers' telecommunications, entertainment and information requirements offering an array of services including streaming audio (radio) and video (television) and local and long distance telephone service along with a variety of electronic commerce, news and entertainment applications.

Any attempt to extend regulatory regimes to Internet-mediated applications runs the risk of creating a dichotomy in regulatory rights and responsibilities between providers of functionally equivalent services. Many of the services available via the Internet provide a faster, better, cheaper and smarter evolution of preexisting services. The Internet provides a convenient, user-friendly medium for acquiring news and entertainment and for engaging in all sorts of commercial transactions. A bias or intention not to regulate, or to regulate lightly such activities may contrast significantly with a preexisting and more intrusive regulatory model. Governments should not automatically extend the application of preexisting regulatory regimes to Internet-mediated equivalent services. Nor should governments deregulate incumbent services simply because Internet options have become available, and governments have opted to apply a different and probably less burdensome regulatory regime to Internet services.

The onset of Internet-mediated services presents a regulatory challenge to governments, particularly those disinclined to treat Internet-mediated services as equivalents to services transmitted and delivered via traditional media. The juxtaposition of different regulatory regimes typically also creates an asymmetry that has the potential for tilting the competitive playing field in favor of the less regulated service. To the extent regulation can impose financial and operational burdens, the service provider subject to greater regulation typically suffers a competitive disadvantage vis a vis the less regulated operator. Governments need compelling justifications for establishing different regulatory regimes in view of the potential for such asymmetry to impact the marketplace attractiveness of one service vis a vis others.

Regulatory dichotomies work best when technological categories remain discrete and absolute. But they surely do not work when technological convergence results in porous service categories and diversification by operators. When

cable television companies and ISPs both offer telephone services functionally similar to what telephone companies, regulators may not be able to maintain preexisting dichotomies. Heretofore, government regulators have assumed that incumbent telephone service providers have dominant market shares, should operate as common carriers and offer the best technologies and wherewithal to achieve universal service goals. Government regulators typically assume that market entrants like ISPS, other enhanced service providers and resellers of basic transmission capacity do not have the potential to acquire a dominant market share, or offer ancillary, non-common carrier services. In the future, such assumptions may prove incorrect.

When ISPs offer consumers telephone service equivalents, which link PSTN access with Internet-mediated telephony, preexisting regulatory exemptions tilt the competitive playing field to their advantage. Should significant telephony traffic volumes migrate to routings exempt from universal service contribution requirement, the sum of funds available to achieve the universal service mission will decline. The potential for declining universal service funds occurs just as many governments have articulated a broader and more ambitious universal service mission for all citizens to have access to both basic telephone service and advanced Internet services.

An Immodest Proposal

The universal service mission may suffer greatly if the FCC continues to apply the basic/enhanced service dichotomy coupled with the different regulatory treatment of common carrier versus private carriers. If the Internet becomes the predominant medium for telecommunications and information services as anticipated, then an increasing volume of traffic previously considered basic, common carrier services will transform into enhanced, private carrier services. This transformation may appeal to deregulatory advocates, but two secondary impacts will have a substantial, adverse impact on the generation of funds for supporting the universal service mission:

- 1) when ISPs offer functionally equivalent long distance services, their non-common carrier, enhanced services provider classification exempts them from paying access charges and contributing to universal service funding; and
- 2) incumbent carriers, fettered with a more onerous universal service burden as a result of asymmetrical regulation, will create new, enhanced service provider

subsidiaries similarly exempt from universal service subsidy obligations.

When Congress enacted the Telecommunications Act of 1996 and expanded the scope of the universal service mission, it ordered the FCC to fund the mission with explicit support mechanisms from all telecommunications carriers. 52 Surely Congress recognized that substantially more funds would have to flow from companies providing telecommunication services to achieve an expanded universal service mission and to replace an unsustainable implicit subsidy mechanism from long distance services to local exchange services. For the subsidy burden to be equitable, all enterprises providing the functional equivalent to interstate telecommunications should make a contribution. This includes ISPs when they hold themselves out as providing telecommunications services like Internet-mediated, long distance telephone services. Likewise, all providers of local exchange services, which can support the universal service mission, should have access to universal service subsidies. This includes wireless operators, such as cellular radio and personal communication service providers when they apply for Eligible Telecommunications Carrier status and hold themselves out as providing the menu of essential local services specified by the FCC.

Few consumers understand or appreciate having new charges on their long distance bills listed as a "universal service charge." Consumer advocates claim that IXCs have passed onto consumers the entire universal service subsidy burden without a commensurate reduction in long distance charges that are possible, because the local access charges paid by IXCs contain a substantially reduced implicit universal service subsidy. At the same time as long distance telephone bills from conventional carriers contain new charges, new Internet telephony services provide substantial savings, partly the result of access charge and universal service funding exemptions. Part of the solution for stabilizing and rationalizing universal service subsidization lies in spreading the financial burden across all providers of long distance telephone services, no matter what their preexisting regulatory classification.

NOTES

One working definition of this mission: "a public policy to spread telecommunications to as many members of society as possible, and to make available, directly or indirectly,

the funds necessary to support the policy." Eli M. Noam, Will Universal Service and Common Carriage Survive the Telecommunications Act of 1996?, 97 Columbia Law Review, 955, 957 (1997).

Universal service programs include funding for schools and libraries, commonly known as the e-rate program; high cost support, a rural health care program and two programs (discounted initial hook up fees and reduced monthly rates) supporting access by people with low incomes. See Federal Communications Commission, Accounting Policy Division, Universal Service, available at • • PRIVATE

• HREF="http://www.fcc.gov/ccb/universal_service/"•

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http://www.fcc.gov/ccb/universal_service/•. In 1998 the Commission adopted annual funding caps of \$2.25 billion for schools and libraries and \$400 million for health care providers.

See International Telecommunication Union, World Telecommunication Development Report 1998, Chapter 4, Universal Access (1998).

Heather E. Hudson, Access to the Digital Economy: Issues in Rural and Developing Nations, paper presented at Understanding the Digital Economy—Data, Tools and Research, conference organized by the United States Department of Commerce, Washington, D.C. May 25-26, 1999, available at •

• PRIVATE HREF="http://mitpress.mit.edu/ude.html;"•

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http://mitpress.mit.edu/ude.html;• see also • HYPERLINK

"http://www.ecommerce.gov" ^•http://www.ecommerce.gov•.

See, e.g., Into Vogelsang, Micro-Economic Effects of Privatizing Telecommunications Enterprises, 13 Boston University International Law Journal (Fall, 1995); Robert J. Saunders, et al., Telecommunications and Economic Development 4 (2d ed. 1994); Ben A. Petrazzini, The Political Economy of Telecommunications Reform in Developing Countries: Privatization and Liberalization in Comparative Perspective 28 (1995); Walter T. Molano, the Logic of Privatization: The Case of Telecommunications in the Southern Cone of Latin America (1997). see also Christopher J. Sozzi, Project Finance and Facilitating Telecommunications Infrastructure Development in Newly-Industrializing Countries, 12 Santa Clara Computer & High Tech.L.J. 435, 436-39 (1996); Bella Mody, et al., Telecommunications Politics: Ownership and Control of the Information Highway in Developing Countries (1995).

"A firm controlling bottleneck facilities has the ability to impede access of its competitors to those facilities.

We must be in a position to contend with this type of potential abuse. We treat control of bottleneck facilities as prima facie evidence of market power requiring detailed regulatory scrutiny. Control of bottleneck facilities is present when a firm or group of firms has sufficient command over some essential commodity or facility in its industry or trade to be able to impede new entrants. Thus bottleneck control describes the structural characteristic of a market that new entrants must either be allowed to share the bottleneck facility or fail." Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorizations Therefor, CC Docket No. 79-252, First Report and Order, 85 FCC 2d at 36.

See Rob Frieden, Contamination of the Common Carrier Concept in Telecommunications, 19 Telecommunications Policy, No. 19, 685-697 (Dec. 1995).

Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 47 U.S.C. § 254

47 U.S.C. 254(e); see also Joint Explanatory Statement at 131 ("In keeping with the conferees' intent that universal service support should be clearly identified, [section 254(e)] states that such support should be made explicit . . .").

47 U.S.C. § 254(d).

See 47 U.S.C. § 254(b)(3).

"In 1983 we adopted a comprehensive 'access charge' plan for the recovery by local exchange carriers (LECs) of the costs associated with the origination and termination of interstate calls. [citing MTS and WATS Market Structure, Memorandum Opinion and Order, 97 FCC 2d 682 (1983) At that time, we concluded that the immediate application of this plan to certain providers of interstate services might unduly burden their operations and cause disruptions in provision of service to the public. Therefore, we granted temporary exemptions from payment of access charges to certain classes of exchange access users, including enhanced service providers." Matter of Amendments of Part 69 of the Commission's Rules Relating to Enhanced Service Providers, CC Docket No. 87-215, Notice of Proposed Rulemaking, 2 FCC Rcd. 4305 (1987) (proposing to imposed access charges on enhanced service lines), terminated, 3 FCC Rcd. 2631(1988) (proposal abandoned on ground that despite the apparent discrimination in charges "a period of change and uncertainty" besetting the enhanced services industry justified ongoing exemption from access charge payments).

Id. at ¶282.

Id. at ¶ 283.

"The mere fact that providers of information services use incumbent LEC networks to receive calls from their customers does not mean that such providers should be subject to an interstate regulatory system designed for circuit-switched interexchange voice telephony. The mere fact that providers of information services use incumbent LEC networks to receive calls from their customers does not mean that such providers should be subject to an interstate regulatory system designed for circuit-switched interexchange voice telephony." Id. at ¶288.

Id. at ¶311.

Section 254(h)(1)(b) requires "telecommunications carriers . . . [to] provide both advanced telecommunications services and additional [FCC designated] services to elementary schools, secondary schools, and libraries for educational purposes at rates less than the amounts charged for similar services to other parties." When providing such discounted "e-rate" services, telecommunications carriers qualify for universal service subsidization. But so too do ISPs, because Section 254(h)(2)(A) requires the FCC to "enhance, to the extent technically feasible and economically reasonable, access to advanced telecommunications and information services for all public and non-profit elementary and secondary school classrooms, health care providers and libraries."

See Sean M. Foley, *The Brewing Controversy Over Internet Service Providers and the Universal Service Fund: A Third Generation Interpretation of Section 254*, 6 *CommLaw Conspectus* 245 (Summer, 1998) (stating the case for eliminating the telecommunications carrier/information service provider distinction and embracing a broader definition of telecommunication service so that ISPs both may universal service contributions and qualify to receive subsidies).

Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket 98-146, Notice of Inquiry, 3 FCC Rcd. 15280 (1998).

Deployment of Wireline Services Offering Advanced Telecommunications Capability, CC Docket No. 98-147, Memorandum Opinion and Order, and Notice of Proposed Rulemaking 13 FCC Rcd. 24012 (1998), First Report and Order and Further Notice of Proposed Rulemaking, 14 FCC Rcd. 4761 (1999); see also *Inquiry Concerning the*

Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket No. 98-146, Report, 14 FCC Rcd. 2398 (1999).

Federal-State Joint Board on Universal Service, CC Docket 96-45, Report to Congress, 13 FCC Rcd. 11,501 (1998), available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/fcc98067.html [hereinafter cited as 1998 Universal Service Report to Congress].

1998 Universal Service Report to Congress at ¶ 3.

Id.

Id.

See id. at ¶ 4.

1998 Universal Service Report to Congress at ¶ 15.

"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 at ¶ 15.

The Communications Act of 1934 now defines information service as "the offering of a capability for generating, acquiring, sorting, transforming, processing, retrieving, utilizing, or making available information via telecommunication, 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).

"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 at ¶ 34. The Commission understand 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.

Id. at ¶ 57.

Id. at ¶ 83.

Internet telephony "offer 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.

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. at ¶ 88.

Id. at ¶ 89.

Id. at ¶ 90.

47 U.S.C. § 160 (1999).

See id. at ¶ 92.

" We continue to believe that alternative calling mechanisms are an important pro-competitive force in the international services market. We need to consider carefully the international regulatory requirements to which phone-to-phone providers would be subject. For example, it may not be appropriate to apply the international accounting rate regime to IP telephony." 1998 Report to Congress at ¶ 93. See also Rob Frieden, "Falling Through the Cracks: International Accounting Rate Reform at the ITU and WTO," 22 Telecommunications Policy No. 11, 963-975 (December 1998).

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 FCC Rcd. at 9173, citing 47 U.S.C. §§ 153(22), 153(43), and 153(46).

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 FCC Rcd. at 9178. 1998 Universal Service Report to Congress at ¶ 16.

Id. at 4. Policy Implications at ¶ 5.

See Jason Oxman, The FCC and the Unregulation of the Internet, Federal Communications Commission, Office of Plans and Policies, OPP Working Paper No. 31 (1999) available at • HYPERLINK

"http://www.fcc.gov/opp/workingp.html"

^•http://www.fcc.gov/opp/workingp.html•.

See President William J. Clinton and Vice President Albert Gore, Jr., A Framework For Global Electronic Commerce, available at • • PRIVATE

HREF="http://www.iitf.nist.gov/elecomm/ecom.html"•

MACROBUTTON HtmlResAnchor http://www.iitf.nist.gov

• (viewed July 22, 1999); United States Department of

Commerce, The Emerging Digital Economy (April 15, 1998)

available at • • PRIVATE

HREF="http://www.ecommerce.gov/emerging.htm;"• MACROBUTTON

HtmlResAnchor http://www.ecommerce.gov/emerging.htm;• and

The Emerging Digital Economy II (June 22, 1999) available

at • HYPERLINK "http://www.ecommerce.gov/ede/"

^•http://www.ecommerce.gov/ede/•.

Id at p. 24-25.

Arturo Gandara, "Equity in an Era of Markets: The Case of Universal Service," 33 Wake Forest L. Rev. 107 (1998).

See e.g., Robert M. Frieden, "Without Public Peer: The Potential Regulatory and Universal Service Consequences of Internet Balkanization," 3 Virginia Journal of Law & Technology 8 (Fall, 1998) available at

http://vjolt.student.virginia.edu/. Kenneth Neil Cukier,

"The Global Internet: A Primer," in Gregory C. Staple, Ed. TeleGeography p. 112 (1999); Robert M. Frieden, "Last Days

of the Free Ride? The Consequences of Settlement-Based Interconnection for the Internet," 1 Info No. 3, 225-238 (June, 1999).

Any telecommunications common carrier can become certified as an eligible telecommunications carrier ("ETC"), and thereby qualified under Section 254 of the Communications Act to receive universal service subsidies. The

appropriate state regulatory commission must determine, pursuant to Section 214(e) of the Communications Act,

that: 1) the candidate carrier provides the base set of services determined by the FCC, pursuant to Section 254(c), as worthy of federal universal service subsidization, e.g., POTS; 2) the carrier advertises the availability of such

services and the applicable charges; 3) the carrier provides the supported services, whether owned or resold, throughout a designated service area; and 4) for service in rural area, the commission determines that certifying this carrier, in addition to the incumbent carrier, would serve the public interest. See 47 U.S.C. § 214(e).

Federal-State Joint Board on Universal Service, CC Docket No. 96-45, Report and Order, FCC 97-157 at ¶ 24 (May 8, 1997); see also Federal-state Joint Board on Universal Service: Promoting Deployment and Subscribership in Unserved and Underserved Areas, Including Tribal and Insular Areas, CC Docket No. 96-45, Further Notice of Proposed Rulemaking, FCC 99-204, 1999 W.L. 684121 F.C.C. (rel. September 3, 1999) (expressing enthusiasm for wireless options).

See Mark J. Ayotte, Eligibility of Wireless Carriers to Receive Universal Service Support, 17 Communications Lawyer 11 (Spring, 1999).

"Incumbent LECs can be expected to oppose ETC designation for . . . [wireless service] providers based on claims of 'affordability' and 'substitutability.' Yet, such tests are wholly unrelated to the governing ETC criteria under Section 214(e) and are merely designed to protect their monopoly position and avoid competition." Id.

47 U.S.C. §254(d) requires "[e]very telecommunications carrier that provides interstate telecommunications services . . . [to] contribute, on an equitable and nondiscriminatory basis, to the specific, predictable, and sufficient mechanisms established by the Commission to preserve and advance universal service."

II.

To Connect a Nation: Convergence and Choice Toward a New
Theory of Universal Service

I See a Nation

Toward an Informed Choice Model of Universal Service for an
Integrated Digital Environment

by

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This paper represents one in a series of papers produced by the Universal Service Working Group of the Institute for Information Policy, in the College of Communications and School of Information Science and Technology, at Penn State University. The project undertaken by the Working Group attempts to envision equal opportunity access and information equity in the Information Age. Members of the Working Group include Jorge Reina Schement, Robert Frieden, Richard D. Taylor, Justin Brown, Scott Forbes, and Sheila Sager.

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I see one-third of a nation ill-housed, ill-clad, ill-nourished.

-- Franklin D. Roosevelt, 2nd Inaugural, 20 January 1937^

From time to time, gaps in the social fabric rip the picture of America as the land of opportunity. Franklin D. Roosevelt addressed the reality of that image at his second inaugural. From a cold, wind-blown platform, he looked out beyond his audience, delivered his famous declaration; and, in so doing tapped into one of the most enduring apprehensions within American culture. Americans, then, found Roosevelt's gaps terrifying. Today, we find a second group of gaps discomfoting.

That gaps fix our attention, shouldn't surprise us. After all, we have built our edifice of democracy on the promise of freedom and justice for all; and, over the centuries we have come to emphasize the all. Americans also hold the fundamental belief that equal opportunity forms the basis for reaping the harvest of the land of plenty. Unlike the Europeans left behind, who accepted a social order where some were destined to power and riches while others were destined to subservience and necessity, we agreed to no such determination. And we still don't.

Entering the Information Age, we carry our convictions with us. In the new era, we firmly believe that access to communications technologies is the primary policy tool for enabling all citizens to participate in those economic, political, and social activities fundamental to a democratic society that is also a good society. We see an accessible National Information Infrastructure (NII) as the essential ingredient for overcoming social fragmentation and, consequently, for enabling participation. In this world, communication creates society; and, in essence, the NII creates the weave that holds us together. So, when we observe or imagine that some are falling behind, we pause as the promise of democracy falters -- thus our anxiety over gaps, especially information gaps.

Anticipating an Unconventional Future

What if everyone could choose the Universal Service most likely to serve their needs?

In this paper, we propose an informed choice model (ICM) of universal service that begins with the notion that people should choose for themselves the configuration of universal service options that best suits their particular needs. In order to deliver on this assumption, the ICM suggested here encourages providers to compete among themselves, in order to deliver a basic bundle of services. That bundle, integrating telephony, broadband, and the Internet, will allow consumers to segment themselves into niche markets defined by needs, income, device, or use patterns. The combination of bundled competition and segmented consumers, we suggest, will be economically and socially efficient, as well as achieving meaningful access at its highest practical levels. This may seem an unusual orientation to Universal Service, for though public policy does not typically alter its track in response to consumer demand, consumer demand does motivate innovation in telecommunications. However, sometimes conditions call for thinking beyond the familiar borders. Since both technology and consumer behavior are moving toward an Internet-based environment that offers refined market segmentation, it makes sense to revise the current configuration of universal service to at least acknowledge if not embrace this trend. The ICM attempts to integrate classical democratic theory, technological advances, and consumer choice into the basis for a Universal Service policy capable of advancing democratic participation in the 21st Century.

In order to propose a model of Universal Service that goes beyond the current assumptions, we have accepted several caveats. First, we assume that telephony, broadband, and Internet services will move toward a common regulatory regime that will contain elements of common carriage. Second, we assume a Universal Service funding system that spans the three delivery media. Neither of these conditions exist today; nor, perhaps, are they probable. Still, they constitute useful givens in so far as they allow us to envision an evolution of Universal Service commensurate with Section 254 of the Telecommunications Act of 1996. In essence, the purpose of this paper is to provoke discussion aimed at envisioning possibilities beyond the present state of Universal Service. (See Table 1 for the standard elements of current Universal Service

policy.)

The Importance of Participation as a Universal Service Goal in American Political Culture.

The idea of universal access to communications technology constitutes a social tool for enabling citizens to participate in the fundamental activities of society especially its economic, political, and social life.^ The framers of the Constitution understood that participation offers benefits that are first political, but also economic, and social, when, in 1789, the Congress mandated the first post road.^ Since then, Americans have looked to a succession of infrastructures -- post roads, canals, railroads, telegraphy, rural free delivery, libraries, public schools, land-grant colleges, telephony, radio, television, broadband, Internet -- to bind themselves together while maintaining the promise of the American dream.

All of the universal services embraced and supported by U.S. governments throughout American history attempt to fulfill the promise of the Constitution by enabling the political, economic, and social participation of citizens. To survive, every democracy needs an informed and involved citizenry, something possible only if its citizens have access to information about their government and the opportunity to participate in political discourse. Citizens should be able to make informed contributions and share in the benefits of the political process when they have heard a variety of opinions openly debated in the marketplace of ideas. Citizens further participate when they communicate and engage in political discourse whether local or national. Thus, citizens must gain access to and effectively use the nation's information infrastructure, if political participation will thrive in the Information Age, .

If political participation defines a democracy, then economic participation lends stability. Information networks distribute economic goods and services, and add value to transactions. Networks carry information that becomes input into products and services as well as transmits information that itself has value as an independent entity. As the number of participants on a network increases, so too does the network's functionality

and value to each of the members of the network; the greater the number of members of the network, the greater the value of the network to each of them. Conversely, without effective access, a person is less likely to contribute to the pool of positive effects generated from multiple interactions on the network. In American history, the web of canals opened the northwest territories to economic development as part of the same United States that extended sovereignty down the Atlantic seaboard. The astounding entrepreneurship and corruption that built the railroad system created truly national markets for eastern manufacturers. And, the extension of a national network of telephone service contributed as much to the shape of American cities as did the automobile. Thus, the economic benefits of an interconnected information infrastructure accrue to the individuals on a network, to the network owners, and function as a powerful integrator for society as a whole.

Communication creates society. Participation in the network forms part of the socialization process through which society engenders loyalty to itself and avoids anomie. After all, humans define themselves not in isolation but through contact with others. Moreover, the range of information provided by any basic telecommunications infrastructure is infinite, ranging from the mundane to the critical. Information networks function for the good of society because they enable the members to use them for their own needs; and by doing so, benefit society as a whole. To search for information on autism, to place a follow-up call for a job interview, to view a presidential debate, or hear one's grandchild from New Jersey to California, all generate value to the user, but they also further the integration of society by rewarding the participation of the members; and, in return, encourage further participation. The antithesis also rings true; existing beyond the reach of the network lowers one's opportunity for participation, resulting in isolation, alienation, and even hostility. Therefore, the network forms an essential structure for overcoming social fragmentation. If the nation wants to encourage the sense of shared values and mutual interdependence that comes from social interaction, then maximum access to communication networks becomes a necessity.

Political, economic, and social participation form the foundation process for a democracy and a good society.

Consequently, any policy with the goal of universal access or participation draws attention to the margins, where those without access merit public concern, scholarly interest, and the focus of policymakers.

Lessons Learned from Consumer Behavior with Implications for a New Universal Service

The premise that people should choose for themselves the configuration of universal service options that best suits their particular needs stems from the findings of a decade of research into the characteristics of households without telephones and the causes of their circumstances. Over the years, academic scholars, corporate investigators, researchers at the National Telecommunications and Information Administration (NTIA), and at the FCC, have contributed a body of data remarkably consistent but surprisingly full of fascinating details (See Appendix 1 for details of the demographics of telephone penetration.). When that data is summarized, seven primary findings point in the direction of exploring new Universal Service possibilities.

Household income is a major factor contributing to lack of access but should be understood as modified by other factors. African-Americans, Hispanics, single mothers, the presence of children, age, and marital status contribute to current telephone penetration gaps. So many identifiable constituents influence lack of access that one may infer a complex set of choices for many households.

Geography influences the existence of information technology gaps. Even within a state, large variations emerge across counties. Indeed, local circumstances may well be the most important contributors to the existence of gaps -- the telephone gap in particular -- and one reason to engage local concerns regarding network access regulation.

For most low income households, gaining access is not the problem they face; managing toll charges tends to be an issue. In other words, policy makers should be asking how to construct a policy that guarantees a portion of baseline local services and also aids those individuals who, for whatever reasons, are unable to maintain toll service. The maintenance of local service should not depend on the

ability to pay for tolled service. If participation is our goal, then Universal Service policy should aim to maintain the most valuable portion of the policy parcel, local service.

Some lower income households are high consumers of enhanced telephone services and cable. This is especially true for African Americans. Furthermore, these same households are often early adopters of these services; and, therefore, contribute to the diffusion of new technologies and services. Perhaps early adopters should be subsidized in a universal service policy; after all, if they help new products get started, then they should be rewarded. When carriers bypass lower income neighborhoods, they act out of their prejudices that these communities lack profitability, rather than solid data.

Information goods requiring one-time only payments—e.g. radio, television, and personal computers—have tended to diffuse more rapidly than information services requiring monthly payment fees such as telephone, cable, and the Internet. In addition, variations in payment options have been shown to improve penetration levels for telephone service; other telecommunications services are probably no different. Thus, some keys to improving public access are located in the nature of the exchange between consumer and producer - pricing makes a difference.

Some information technology gaps have persisted with maddening tenacity but that is not true for all. For instance, though male users once comprised the vast majority of all Internet and World Wide Web (WWW) users, women now constitute the majority of new users and have a much higher PC adoption rate than men. Recent surveys suggest women will be the majority of all Internet users by a slim margin as early as 2002, mirroring their proportion of the total population.[^] Also, Hispanic households continue to outpace all other ethnic groups in terms of acquiring new PC users; they have doubled the number of computers in their homes in the last four years and are joining online services faster than the national average.[^] Uplifting findings such as these demonstrate that a new technology can rapidly diffuse into minority populations faster than previously thought. Consequently, there appears to be an opportunity here to exploit those gaps that are rapidly closing in order to influence those that linger.[^] At the very least, incorporating the Internet

into bundles Universal Service makes sense.

Household uses of new technologies vary widely with no simple patterns emerging. That individuals exhibit remarkable creativity as they construct seamless information environments in their homes, points to the importance of enabling choice in Universal Service.

Almost certainly, continuing research will discover new consumption and access patterns that will influence how we think of access gaps and their remedies. Granted, we should pursue more inquiry; but, at the same time, we should make use of the excellent body of data available to us now.

Why Some Consumer Information Technologies Diffuse in a Decade While Others Take More than a Century

Of the hundreds of studies concerned with universal service, only a few address gaps in telephone, broadband, or Internet penetration and their social causes. Until the late 1980s the weight of opinion on households without telephones seems to have been that existing subsidy programs adequately included all those that could reasonably be connected. Thus, for the first century of telephone service, little or no thought was given to those left off the net. Only in the period immediately after the break-up of AT&T did some voices focus on the social dynamics of those without telephone service and point to socio-economic factors as causes of phonelessness. These studies constitute the empirical source of the call to rethink universal service accomplishments in light of the emergence of a new information infrastructure. However, while some of these studies point to and describe the gap in telephone penetration between the majority and various population groups at the margins of the information infrastructure, almost nothing published points to causes of the gap. Under these circumstances, an analysis of historical gaps can be instructive. The spread of some earlier information technologies indicates that gaps can be temporary.

Radio and television: in 1925, 10% of all households owned radios (see Figure A). By 1930, ownership stood at 46%. Ten years later, in the throes of the Depression, Americans still managed to increase ownership of radios to 82% of all

households, buying radios at an astonishing rate; especially when one considers that the Depression forced personal expenditures on information goods and services to drop from 4.4% of all personal expenditures in 1930 to 3.5% in 1935, not recovering the 1930 level until 1945.^ Radio's astonishing growth masks the existence of a gap that might have existed between the majority and minorities. If there ever was a gap, and given what we know of subsequent gaps there is every reason to believe that a radio gap existed for a time, that gap closed by 1950 so that nearly every household had a radio as they still do today.

In that same year, less than one household in ten owned a television. However, fifteen years later, less than one household in ten remained without a TV -- television's complete adoption took less time than radio. Yet in this case, we have evidence of an income gap during the period of television's diffusion (See Figure A.). During the first seven years of the diffusion of television, lower income groups lagged behind wealthier groups. The wealthiest quartile led the way so that by 1956 this group had reached 90% penetration, while the poorest quartile lagged at less than 60%. Nevertheless, by 1970, television had reached a saturation level equal to that of radio.

Telephone: the third information technology of the era presents a stark contrast. From 1878, with the establishment of the first practical exchange, 80 years passed before 3 out of 4 households boasted a telephone.^ And, though the adoption of radio sets proved immune to the Depression, telephone penetration dipped in correlation with personal expenditures. Telephones reached saturation by 1970, with 93% of households slowly advancing to 94% in the twenty years since -- a diffusion rate of less than one percent per year.^

What should we make of gaps that pass and gaps that persist (See Figure B.)? Clearly, gaps that resist closure pose the greater threat to participation. What we know is this. Information goods, like radios and TVs, diffuse very rapidly, and those gaps that open early close quickly. Information services, especially those that require deployment of infrastructure such as electrification, broadband, and telephone, diffuse much more slowly. Sixty years to saturation for electrification; 55 years and counting for cable; 100 years for the telephone. The reason is not hard to discern. Goods require a one time

purchase for which the household can save; whereas, information services -- including electrification as a service -- require a decision to pay every month. This begins to explain why radio purchases skyrocketed during the Depression, while telephone and electrification faltered. The requirement of a deployed infrastructure added further constraints. That said, we should keep in mind that gaps are a natural feature of the diffusion of any technology; however, their temporality varies widely. Thus, to insure access, we must pick and choose carefully those gaps that deserve our attention.

So, what about gaps in access to the Internet, currently at the forefront of policy discourse and most likely the future medium for all communications technologies? That Internet service provision requires periodic payments, and the deployment of infrastructure places it closer to the telephone than to TV. That said, the deployment of Internet services on the back of the already existing telephone and broadband infrastructures will most likely accelerate the diffusion of Internet access. Yet any downturn in the economy will cause some households to drop the service. Moreover, poorer households will experience an inability to maintain the service, just as they do today with telephone and cable. Therefore, given the importance of the Internet to the promise of participation, policy makers should learn the lesson of gaps in history; they should pay special attention to the diffusion of Internet service, and seek policies to support its widespread availability.

From Research Findings to Universal Service as an Evolving Concept

^(1) IN GENERAL- Universal service is an evolving level of telecommunications services that the Commission shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services. ...^

The acknowledgement that Universal Service Policy can and should be thought of as an evolving concept invites the re-imagination of Universal Service along dimensions that reflect the brave new world of the information age.

Whereas, in the domain of the Communications Act of 1934, Universal Service existed as a policy decree; in the Telecommunications Act of 1996, Universal Service emerges as a dynamic discourse seeking to improve access in the real world of people's lives. Consequently, the research ferment of the 1990s has served to expand the factual and theoretical bases for formulating universal service policy.

First, in tandem with the work done by the FCC and the developers of the NII, recent research has sharpened the collective portrait of the 6.2 million Americans who do not have telephones in their household.^ Second, by exploring the reasons why people do not have phones, recent research has provided the factual grounds for challenging a conventional tenet of universal service policy. This tenet states that universal service should be focused on providing access to local telephone service at affordable rates. In contrast, research, whether it is conducted in New Jersey, Texas or Kansas, consistently shows that people are driven off the phone network by the costs which result from using the phone and not by the costs of basic service.^ Third, some research suggests that different social groups employ varying combinations of media to meet their specific needs.^ The rational reasons given for these choices stress, for example, the positive cost effective value of media which provide family entertainment. As such, these intriguing results suggest that people without phones desire connectedness and pursue strategies designed to make the best of their circumstances. By distilling these lessons, an evolving Universal Service policy will acknowledge disparate circumstances, especially for those at the margins; and, in so doing, will seek to build on varied needs rather than fixing on a single decree.

In the past, Americans have thought of policies as statements whereby government brought order and structure to the information environment of a particular technology; and, in so doing, sought to achieve a societal good. Under the old concept, Universal Service simply represented the intent to wire the nation. To think otherwise was unimaginable. Now we suggest that the welfare of society may be better achieved if people actively shape the content of Universal Service for themselves. Such a proposal still borders on the unimaginable. Yet, as we increasingly balance the technological opportunities available to us against the burdens of shifting demographics and poverty,

we must stretch our imaginations. Americans will continue their long-term adoption of more and different new media, while they invent more and different uses. The emerging picture is not one of convergence in the social landscape but of divergence, with immense variations in capabilities. A new universal service should respond effectively to this changing terrain.

The Basic Assumptions of an Informed Choice Model of Universal Service

Universal Service represents maximum connectivity in a policy whose goal is to create a vigorous democracy from a unified nation as it enters the dimension of cyberspace. In this sense, the National Information Infrastructure serves the same unifying purpose as did the roads of the Roman Empire, Britain's sea lanes, and the railroad tracks of the U.S. west. Hence, not all of these recommendations are new. Many of them have deep precedent, and some are already in place in a limited number of locations; but here, the whole is greater than the sum of the parts. In order to formulate Universal Service anew, we begin with five basic assumptions.

Universality. Universal Service should offer interconnectedness across a range of media as an opportunity to all Americans. The goal should be to allow any American to reach any other American within a reasonable time table. The boundaries of the technology should be transparent.

Interactivity. Universal Service should pursue the integration of telephony, broadband, and Internet technologies, in order to allow users to communicate across platforms in a transparent environment.

Content. Information necessary to achieve universality and interactivity, and so enable basic democratic, economic, and social participation, should be available to all at a reasonable price.

Personal Choice. Americans should enjoy the freedom to choose the configuration of access technologies and information services that constitutes the optimal universal service for their individual circumstances.

Affordability. Use of the information infrastructure must fall within the means of all Americans. The rate structure should aim at maximizing the number of participants. Regulations should aim to facilitate staying on the network.

Elements of an Informed Choice Model of Universal Service

1. Open Competition and Choice.

In principle, any entity wishing to offer a basic bundle should be free to enter the market. Consumers should enjoy the widest possible range of choices, in order to maximize the value of access configurations to themselves. Clearly, if the goal is to meet the needs of individuals, as they themselves perceive these needs, then individuals must be able to choose among differentiated offerings.

The importance of choice derives from the convergence of previously distinct media and the individualistic uses to which they are put. In the old days of Ma Bell, a kind of federalism reigned. Universal service in telephony was conceived as the provision of dial tone, the mechanics of which made it difficult to imagine it in a subjective context; after all, a phone is a phone is a phone.[^] Yet, even with POTS people found creative uses for the uniformly black appliance.[^] Similarly, cable's value as a baby sitter has come to outweigh its informational content in some households.[^] And, as for the Internet, inventive uses define its expansion. Indeed, inventiveness now characterizes consumer behavior so much so that the boundaries of the three media have fallen as much from consumer imagination as they have from engineered design. Universal Service should, therefore, enable individuals to invent uses that make access meaningful.

The value of choice notwithstanding, open competition as a proposal raises some interesting questions.

If all providers are invited, how will they communicate their offerings to consumers? The traditional state utility commission solution has been to mandate flyers to be enclosed in the phone bill, or cable bill. Nonetheless, anecdotal testimony at meetings of the National Association of Regulatory and Utilities Commissioners indicates that consumers typically miss the enclosed messages. A market

open to all, however, implies marketing. Providers competing for customers in niche markets will feel encouraged to appeal through every tactic in the marketer's arsenal. Markets where providers compete strongly for a share will most likely experience a blizzard of pitches. Such an intense marketing barrage might well overwhelm many consumers, but it falls within the customs of American commercial culture.

In a free-for-all market, won't big providers squeeze out everyone else? Certainly, rough and tumble markets are unkind to small players. Moreover, the tendency in telecommunications has been for the big to get bigger and dominate. Still, if the growth of dominating corporate actors is a problem of policy, it should not be addressed through Universal Service. The purpose of Universal Service is to maximize access; to encumber it from the start with the management of competition will dilute its aim.

Will open competition guarantee service to poor, rural, and/or minority households? In theory, someone will want to serve every segment of the greater market because there are profits to be gained from each segment. In practice, corporate strategists are just people, with cultural assumptions and blindspots. The rush among telecommunications providers of the last few years to serve business and upscale household markets indicates that market segments will receive varying attention from vendors. And, even though evidence suggests that minority households are higher consumers of advanced telephone and premier cable services than comparable white households, telecommunications marketers still tend to prefer white consumers. On the other hand, deregulation enthusiasts will assure policy makers that, left alone, providers will get around to serving "marginal" market segments once the highly profitable "core" segments have been developed. They will suggest that emerging telecommunications markets should be thought of as comparable in evolution to the diffusion of television - everyone that wants one has one. That 20 million Americans remain without telephone service in the 124th year of telephone history should counter beliefs that those without telephones are satisfied, or that service to all is inevitable. We strongly suggest that the element of open competition as we propose it in this model will integrate a basic service across technologies and establish the basis for meeting a greater

range of individual needs; but it will not, in and of itself, reach out to all segments of society. The FCC and public utility commissions (PUCs) will have to continue existing discussions aimed at meeting the needs of underserved populations.

2. Bundled Services.

Universal Service, in order to enable basic access in a converged technological environment, should allow individuals to connect to the national network transparently across media. The bundling of telephone, broadband, and Internet services will enhance choice and enable consumers to tailor the configuration of telecommunications services to their own personal circumstances. Therefore, providers should be encouraged to offer as many bundles as they wish, in order to pursue strategies of market segmentation.

Bundling services sounds fairly simple on the surface, but it raises a fundamental question: Who will choose the bundles? Historically, the make up of Universal Service reflected negotiations between the FCC, PUCs, some citizens' groups, and the monopoly provider, AT&T. For most of the century, AT&T's vision, reflected by the FCC, determined everyone else's horizons. Sometimes one vision can establish the degrees of freedom of the players. So, one possibility would be for the FCC to determine the contents of the bundles. Yet, if it did so, it would almost certainly lead to widespread dissatisfaction, and would be out of step with the thrust of the deregulation inherent in the overall idea of the ICM. Alternately, we suggest that the FCC invite providers to offer as many bundles in as many configurations as they wish to bring to the market. Providers will instinctively offer numerous bundles to segment the market into consumer groupings that facilitate marketing appeals and bolster product loyalty. Given that market segmentation as a strategy is popularly understood in the business world, we can expect to see creative and aggressive bundling as providers jostle each other to dominate niches. Similarly, since American consumers generally behave with sophistication when selecting among competing products, we can expect to see consumers discriminating in their choices of bundles. The immediate result should be the rapid discovery of niches; and, as a consequence, knowledge of who is being overlooked.

That said, telecommunications services seem to hold a greater potential for confusing customers than do other kinds of products. In addition, the lure of profits inherent in competitive bundling may also lead to fraud. If "slamming" is a festering problem in the long-distance market, it will likely grow to a full blown sore in the bundling market. When consumers face many choices, some confusion is inevitable, and conditions will be ripe for unscrupulous "venders" to prey on the less aware. If consumer confidence is to be maintained, then the FCC can minimize the damage through aggressive enforcement. The move to competitive bundling should be accompanied by FCC and Justice Department preparedness.

3. Setting the Price of Bundles.

Strictly speaking, the question of pricing extends beyond the focus of this paper. Still, a few thoughts on pricing may help the discussion.

The pricing possibilities fall somewhere between two familiar poles. At one end, bundle providers set the price of their bundles. If they do, even under the oversight of the FCC, competition receives a strong boost. However, an open pricing regime may not provide service affordable to all Americans; some phone companies have been slow to target low income households even though those same households are high users of advanced services. In addition, new entrants providing local telephone service have largely ignored the potential in low income markets. At the other end, the FCC sets the price of the basic bundle and allows providers to compete on the content of the bundle. Such a policy offers assurances to lower income consumers that they have been remembered in the transition, but will likely be opposed by venders who will argue against being shackled to a fixed price (or prices) in such a competitive arena. (And, in all fairness, they will make the point that a fixed price for the basic bundle contradicts the principle of deregulation.) Still, the relationship between affordability and access persists as a source of confusion. In other words, we know that gaining access to the network is not the problem for most low income households; the problem is staying on the network as a result of losing control over toll charges. How, then, to unleash market forces while still offering opportunity to those who struggle to stay in the market? The FCC could

test the feasibility of various open pricing strategies balanced by instituting guarantees against losing basic services, guarantees that already exist in some states for telephone access. Clearly, the challenge of affordable pricing carries complex nuances for policy makers. If they want to maximize sustainable access, they should concentrate their focus on the balance between the benefits of open competition and the necessity for guarantees that will allow lower income consumers to stay on the net.

4. Protection of existing Universal Service Guarantees.

As a pledge against unintentionally widening access gaps, all bundles should be required to provide existing basic telephone service at a minimum (i.e., dial tone, directory assistance, emergency assistance, local and long-distance service). There is no merit in attempting an advance by losing ground. Plus, compared to the expected profitability of service sold in the future converged environment, basic telephone service represents a small portion of the pie that's still in the oven. As the portal to other services, an aggressive marketing strategy will offer connectivity at minimal cost or give it away. Citizens should expect the warranty that they will not lose basic universal services in the transition to a new Universal Service regime. In this way, as Universal Service expands to embrace broadband and the Internet, it will build on its traditional solid base.

5. Leading from the Bottom Up.

Agencies with an understanding of local conditions, such as state PUCs, should be encouraged to take the lead in assessing local needs to identify specific access gaps and needs. In recent years, we've discovered that telephone penetration varies dramatically at the local level. County by county variations are typical in most states, even when examining conditions for a single ethnic group or demographic category. The persistence of these findings challenges the notion that a single universal service policy offers the most effective delivery of access for all. Conditions faced by Navajos on their reservation in northern Arizona vary in substantive ways from conditions faced by Latinos residing in Phoenix. Furthermore, we may extrapolate that Navajos and Latinos will organize their choices according to different priorities. If one considers that variations such as these occur across the

United States in combinations we have yet to understand, then one can appreciate the importance of a Universal Service policy that emphasizes choice and offers as many choices as is reasonably possible. And, for those choices to be meaningful, Universal Service deliberations should include state entities as leaders in the discourse.

The ICM in Play...

We began with the notion that people should choose for themselves the configuration of universal service options that best suits their particular needs. We further established five basic requirements to be met by a new Universal Service regime. Emphasizing a bundle of services across technologies accomplishes the objectives of universality and interactivity. Emphasizing competition enhances personal choice, and most likely content since it is an obvious competitive asset. Telecommunications firms have already discovered the usefulness of bundling and menu options and have begun to offer bundles comparable to what is advocated here. In the meantime, ISPs already offer multiple services, engaging in "versioning"—offering differentiating products with slight variations in quality and price.[^] On the objective of affordability, we are less certain. Since the price of access is not the main reason that telephone penetration hovers at 93%, a significant factor in the achievement of affordability will depend on a regulatory solution allowing individuals to maintain some basic service when they cannot pay their toll charges. However, in an environment where bundles include multiple services, we can also imagine a free-floating price of the basic bundle settling at a level that will make access unaffordable to as much as 7 to 10% of households. We recommend a combination of give away POTS, combined with market niche pricing and guarantees where the market ends. Most certainly, the funding scheme will play a key role in the success or failure of any Universal Service policy that attempts to go beyond the status quo; and, as we warned earlier, that is a topic for another paper.

To be sure, these are complex and critical issues facing a nation committed to maximizing access for all of its members. To insist on framing these issues solely within the constraints of the short term needs of corporate and governmental players is to miss the opportunity to build an equitable foundation for the Information Age. Universal Service should lead to free and open communications for all

Americans. If we set ourselves the task of building a model of Universal Service sensitive to the varying needs of a diverse population, then political participation, economic development, and social empowerment will result. We should now aim to formalize this discussion at the policy level, in order to begin the discourse necessary to define the goals, procedures, and regulatory oversight required for all providers—not just the largest telcos—to effectively implement a menu of services and serve the populace in an efficient and profitable manner.

In the past, it was been common to think of policies as statements whereby governments brought order and structure to the information environment of a particular technology. Under the old concept, universal service simply represented an intent to wire a nation. To suggest otherwise placed one beyond the pale. Now, we suggest that the welfare of the American people will be more efficiently achieved if people actively choose the configuration of their own access. Thus the key to an effective universal service paradigm—one which can double as an effective business strategy—is to provide a menu of technology and payment choices to potential users whether it be offering ground line telephone service, wireless PCS subscriptions, a subsidized prepaid phone card, or merely an option to pay bimonthly. By moving away from the static notion of universal service and toward a dynamic choice model, we can initiate a reconceptualization of the universal service discussion for the next century.

Appendix 1

The Telephone and the Demographics of Universal Service

Concentration on lessons learned from research on households with and without telephone service may seem irrelevant for an information infrastructure expected to be patterned by the Internet. However, lessons learned from the telephone are instructive for the following reasons. First, a great deal of data exists on the characteristics of households with and those without telephone. Second, demographic characteristics of households without telephones appear equally relevant for understanding penetration patterns for Internet services. And, third, use behaviors apply to Internet technologies as well.

When that data is summarized, six sets of primary findings point in the direction of exploring new Universal Service possibilities.

Despite the importance of having access to basic communications services, approximately 6 % of the people in the United States still do not have access to a telephone (Federal Communications Commission, 1998).^{^ ^} And, the states exhibit considerable variation in telephone penetration rates by household: from a low of 86.2% in New Mexico to a high of 98% in Pennsylvania (Federal and State Staff for the Federal-State Joint Board CC Docket No. 87-339, 1997).[^]

Beneath these two extremes, lies a most intricate picture with tangled themes -- poverty, ethnicity, mobility, privacy, disconnection

Poverty

Income is a major cause of phonelessness, but not the sole cause.

Among adult heads of households between the ages of 15 and 24, 15% are nonsubscribers, the highest of any age group (Federal-State Staff, 1997);[^]

Among households with annual incomes of less than \$10,000, 14.6% are nonsubscribers and, as expected, this figure decreases with income increases. Again, aggregate figures mask the state to state variations. For this income group,

nonsubscribership rates range from a low of 3.4% in Connecticut to a high of 31.5% in New Mexico (Federal-State Staff, 1997);^

More than two thirds of those households without telephone service have annual incomes of \$15,000 or less. (U.S. Bureau of the Census, 1994);

Nonsubscribership among households headed by females with children living at or below the poverty line is approximately 50% (U.S. Bureau of the Census, 1994);

Poverty, or low income, is a primary predictor of nonsubscribership. More than two thirds of those without telephone service have annual incomes of \$15,000 or less. One of the noteworthy findings in recent analyses of census data on telephone subscribership is the very high rate of nonsubscribership among those households dependent on public assistance (U.S. Bureau of the Census, 1994);

17.6% of households in subsidized housing are without telephones (an increase of close to 2% from 10 years ago) (U.S. Bureau of the Census, 1994);

31% of households receiving food stamps have no telephone (U.S. Bureau of the Census, 1994);

27.9% of households on welfare lack telephones (U.S. Bureau of the Census, 1994); and,

43.5% of households that are completely dependent on public assistance lack a telephone (U.S. Bureau of the Census, 1994).

Ethnicity

Ethnicity confounds income, to some extent.

Rates of nonsubscription for minorities of this age are even higher. 27.1% of households headed by people of Hispanic origin, and 22.7% of households headed by African-Americans are without service. This compares with a nonsubscription rate of 13.8% for whites within the same age range (Federal-State Staff, 1997).^

When households below median income are compared, whites enjoy higher levels of telephone penetration than blacks or Hispanics, even within the same income stratum.

Property

The lack of a permanently owned residence also strongly correlates with the absence of telephone service:

Renters are six times more likely than home owners to be without a telephone (U.S. Bureau of the Census, 1994);

In New York State, renters make up 90% of the households without telephones (Department of Telecommunications & Energy, 1993);

Mobility

In a country whose population moves often, mobility sometimes deters telephone service.

In those parts of California where subscribership fell below 90% more than half of the nonsubscribers had lived at their current address for less than one year (Field Research Corporation, 1993); and

A person in-transit is less likely to have a telephone than a long-term resident (e.g., Chesapeake & Potomac Telephone Company, 1993; Rubin, 1993).

Privacy

Some people may elect to go without telephone service because they believe it enables intrusions on their privacy:

Some low income households may not subscribe to telephone service in order to avoid intrusion from unwanted sources. For example, Latinos in California report concerns about being reported to governmental agencies but these concerns rank well below other factors as reasons for not having phone service (Field Research Corporation, 1993).[^] Making telephone service more affordable may not bring these households onto the network; and

Ethnographic research suggests that different social groups create varying combinations of media to meet their needs.

For example, in some cases cable service is chosen over telephone service as a response to family circumstances (Horrigan & Rhodes, 1995; Mueller & Schement, 1995).

Disconnection

Even so, it would be inaccurate to say that most households without telephone service would prefer to be without service. The majority of those without telephone service once were subscribers (U.S. Bureau of the Census, 1994). Toll charges seem to be a key factor in nonsubscription:

Of the nonsubscribers who previously had service, the principal reason for their current nonsubscription is their inability to pay toll charges, and this may be the single most frequent reason households are disconnected from the public switched network (Mueller & Schement, 1995);[^]

Most customers involuntarily disconnected are above-average users of toll telephone service (U.S. Bureau of the Census, 1994); and

Disconnection for nonpayment of toll charges is likely to occur disproportionately among low-income minorities (Chesapeake & Potomac Telephone Company; Field Research Corporation; Mueller & Schement).

In sum, there exists a strong positive correlation between income and subscribership. However, ethnicity seems to make a difference in subscription rates. In addition, most households without telephones subscribed previously and were subsequently disconnected from the network. And, then, when forced by limited disposable income to choose among media, people make their selections based on their immediate circumstances and the benefits they anticipate receiving.

Table 1: Elements of Current Universal Service as they Apply to Households

Primary Objectives"Optional Services""Equitable Pricing"Information on Existing Technologies""Efficient Billing System"Training Programs""Extensive Network Coverage"Touchtone for Teleservices""Goal-oriented Subsidization"Companion Services^""Connection to Internet""Standard Services"Access to Public Electronic Databases""Public Payphones"Digital Switching""Emergency Assistance"Advanced Data Transmission (ISDN, T-1, etc.)""Handicap Access"Video Transmission""Toll and Long Distance Calls"Electronic Commerce^""Voice Transmission""Data Transmission (via modem)""

Figure A

✓

Compiled from Wilbur Schramm (1960). Mass Communications.
Urbana:
University of Illinois Press. p. 108.

Figure B

Diffusion of Selected Media

Compiled from Series R 1-12. (1975). Historical statistics of the United States, colonial times to 1970 (Bicentennial Ed. ed.). Washington DC: GPO. Table 956. (1981). Statistical abstract: 1981. Washington, D.C.: U.S. Bureau of the Census. Table 884. (1992). Statistical abstract: 1992. Washington, D.C.: U.S. Bureau of the Census. Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission.

III.

To Connect a Nation: Convergence and Choice Toward a New
Theory of Universal Service

KEEPING FUNDING UP WITH TECHNOLOGY:
AVOIDING THE COMING CRISIS IN UNIVERSAL SERVICE FUNDING

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KEEPING FUNDING UP WITH TECHNOLOGY:
AVOIDING THE COMING CRISIS IN UNIVERSAL SERVICE FUNDING

Summary

Funding for universal service as currently structured will not achieve the goals of Congress in providing universal access to advanced telecommunications services. However,

all of the necessary tools and models are already available, and only need to be adapted.

Experience shows that the normal workings of the market will not provide the desired Congressional policy outcome of providing access to all at an affordable price. The private sector is gradually making access to advanced services widely available. However, there will be a transition period of years before it is as ubiquitous as telephone service.

The current universal service funding arrangement will be inadequate to meet future needs as technology evolves and "advanced services" become the norm. Changes in technology, and migration to unregulated services due to regulatory arbitrage make this inevitable.

Subsidies for high cost areas (infrastructure) should be maintained, but targeted as precisely as possible. As a general principle, to the maximum extent feasible, preference should be given to targeted support rather than general infrastructure support, to avoid unnecessarily subsidizing high-income rural users.

The scope of subsidies for individuals or households (means tested) must be expanded to incorporate all functionalities and devices necessary to access advanced services and provide maximum choice of services. A "basket of services" approach should include both voice and data/digital based services.

The base of contributors to the universal service pool must be expanded to all those in the chain of access and value. There should be symmetry between contributions to, and access to, the pool of universal service revenues. Internet carriers, ISPs, cable telecommunications and "broadband" companies, and wireless and satellite companies that provide similar functionalities should be treated the same. To the extent equipment or software manufacturers are subsidized, they should contribute.

A fair balance should be sought between state and federal contributions. The role of states in targeting low-income users should continue. The net balance of transfer payments (costs to consumers) between low-cost and high-cost areas between and within states should be transparent.

Support for schools, libraries and rural health care, which already provides for advanced services, should be continued, with an emphasis on serving the most needy first.

Priority should be given to expanding the E-rate to include urban health care, as well as to ancillary services such as training, to make it effective. Including non-profit and community groups engaged in bringing advanced services to unserved or underserved constituencies would further serve the goals of Congress.

Efforts should be made to integrate universal service funding with governmental and private initiatives to maximize efficiencies.

I. INTRODUCTION: THE GREAT TRANSITION

The traditional telephone universal service program is entering a period of transition, as communications technology, policy and industry structures realign themselves. The United States is moving into an era in which multi-purpose broadband digital technologies will likely, over time, become as ubiquitous as the telephone is today. The universal service funding process must be adapted to keep up with these changes, or ultimately face a crisis of support.

The Schement paper sets forth the social, political and equitable reasons society and democracy will benefit from having this technology accessible to everyone. The Frieden paper highlights the legal and regulatory hurdles to implementing a new model of universal service. This paper focuses on the changes that will be required to financially support a vision of universal "advanced telecommunications services," to bridge the "digital divide".

In the Telecommunications Act of 1996 (the "Act"), Congress articulated a complex vision of the future of telecommunications, including both competition, expanded universal service, and deregulation. Since there are internal tensions between these policy goals, the Federal Communications Commission has been struggling to reconcile them and find a balance.

Congress intended competition to play the major role in future telecommunications developments. To the extent the universal service goals of the Act will be achieved, they will be achieved in part through the working of the marketplace. It is likely that the market for advanced services will be highly dynamic, and the attempt to meet demand quite creative. However, history shows clearly that market forces alone will not meet all the needs of society, especially for groups such as the poor, the handicapped, and Native Americans, in a timely manner, if at all.

Even if farsighted universal service policies are adopted, there is an extensive, complex and costly embedded set of structures around traditional universal service that must be transformed. The challenge is doing this at a time of fundamental changes, including:

Monopoly to Competition. The transition from a regulated monopoly system to one based on competition.

Implicit to Explicit. Congress has mandated that universal service funding being made transparent and explicit.

Telephony to Multimedia. The technology of telecommunications has moved from single-purpose, circuit-switched analog telephone systems to multi-media, multi-purpose, packet-switched digital systems. Modern universal service was founded on the concept of making voice telephony available to all. But now, "advanced services" digital networks carry packets of voice, video and data bits indifferently.

Scale and Scope. The economies of scale and the global nature of these new networks have led to the horizontal, vertical and global integration of the enterprises engaged in the production, packaging, marketing, distribution and transport of bit streams representing both telecommunications services (e.g., voice service, wireless, cable TV, Internet access) and the content of these services.

Bundled Services. Consumers will be offered competing bundles of integrated services, combining regulated, unregulated and protected components. These "bundles" will offer various functionalities, but internally, they are simply packets of identical bits constructed into different applications by software instructions, delivered by a multiplicity of transport technologies.

New Business Models. Charging consumers based on criteria such as time of call, time of day, distance of call, local vs. long-distance, etc. is giving way to charging for components in a hierarchy of functionalities and content. As traditional charging criteria lose relevance, they are replaced by components such as: access (connection) to the network; network compatible software and hardware; Internet connectivity (which may include a local transport component, a local ISP transport component; and connection to the backbone network through an ISP); bit rate (speed of connection); quality of service; available applications based on levels in a protocol stack (e.g., encryption); simple (e.g., e-mail) and complex programs (translation), and access to content, both free and for a charge. If there is to be a successful "universal advanced service"

funding plan, it must be far more flexible and comprehensive than the traditional model.

Permeable Jurisdictional Boundaries. The Internet and global packet-switched networks make it almost impossible to separate traffic based on LATAs or state or national borders. Any meaningful distinction between local, long distance and international diminishes in a way that is not easily conformable to existing regulatory structures.

II. THE TELECOMMUNICATIONS ACT OF 1996 OBJECTIVES OF UNIVERSAL SERVICE: COMPETITION, ACCESS, DEREGULATION

On February 8, 1996 President Clinton signed into law the Telecommunications Act of 1996, the first comprehensive revision of the country's communications laws in more than 60 years. Three important themes run through this legislation.

First, the Act was about facilitating the benefits of competition. Second, and equally, the Act was about ensuring that all Americans would share in the benefits of the telecommunication revolution through a promise that all Americans would have access to comparable services at comparable rates. Third, unnecessary and counterproductive regulations were to be eliminated or modified.

The Act enables new competition by lowering barriers to entry of all sorts: eliminating laws and regulations that prevent firms from participating in telecommunications markets and restrict consumers' choices; implementing new operational procedures that make it easier for consumers to switch between telecommunications companies; and obliging incumbent telephone companies to share their networks with competitors.

But Congress also envisioned delivering these benefits to all communities of consumers: to both business and residential markets, to rich and poor communities, and in cities, suburbs, and rural areas. Rates for telecommunications services should be "just, reasonable, and affordable"; advanced services should be available everywhere; and rates should be about the same in rural, high cost areas as in urban areas.

This creates a conundrum for policy. The ordinary working of the market will not likely produce the policy outcomes desired by Congress. If the cost of serving a community is higher, or consumers' willingness to pay is lower than elsewhere, then the community very well may attract less

competition to provide a service, or perhaps no competition at all.

So how can universal service goals be achieved along with competition? Congress' answer is to subsidize competition where universal service is deficient. The Act specifies that universal subsidies must be financed by "contributions" from telecommunications companies. In competitive markets, the companies required to do the contributing will recover the cost of their universal service contributions from their customers through higher prices. Some consumers somewhere will pay above cost, so that other consumers somewhere else can pay below cost. Adopting this policy is a Congressional affirmation of belief in positive network externalities, democratic values, and traditional American egalitarianism for fundamentals like universal schooling, literacy or voting rights.

The Congressional mandate to introduce competition, and the redistributive nature of universal service, have required the FCC to take a multi-pronged approach to adjusting the mechanics of telecommunications regulation. There are three areas that the FCC believes must be dealt with simultaneously to produce a workable solution. These are: Adjusting the cost of access between local and interexchange carriers to reflect actual costs; Requiring local exchange carriers to allow competitors to interconnect to their systems and lease their facilities at prices and on terms that will allow them to be competitive, and; Creating a separate mechanism for sizing, collecting and distributing universal service contributions in a fair and balanced way.

Given these factors, the migration path from the historic system of funding universal service to a system that operates in a competitive environment is far from simple. It is the goal of Congress that competition be introduced, universal service be expanded, and prices nationwide be comparable, in a way that is fair to everyone. Given the nature of the embedded system, this is quite a challenge. The Act did not simply say: "Maintain universal service". Rather, the Act said that universal service must be "preserved and advanced" and be sufficient to support an "evolving level of service" provided through new technologies. Universal service is meant to be a driving force for investment in the new generation of service - not a constrained system looking backward on yesterday's technology.

Given Congress' goals, national policy needs to create redistributive structures that distort the markets as little as possible while serving those who might otherwise be unserved or underserved. To fund these programs, several alternative choices of revenue sources have been proposed. Congress was aware of them when making its decision on the method of universal service funding.

Alternative possible revenue sources include:

General tax revenues

Redirection of the telecommunications tax

Value-added tax

Tax on equipment

End-user tax

Money from FCC spectrum auctions

Bit tax

Savings from network efficiencies

Congress concluded that the approach that would be both most fair and most stable (avoiding the vagaries of annual Congressional funding debates) would be an expanded program of "contributions" based on a percentage of telecommunications carriers' gross revenues. This is a principle that can easily be expanded to include all participants in providing "advanced services". As Congress prefers to move incrementally, this would also be politically less complex.

PRINCIPLES OF UNIVERSAL SERVICE: JUST, REASONABLE, AFFORDABLE

Sec. 254 (b) of the Act sets forth the following universal service principles:

Quality and Rates. -- Quality services should be available at just, reasonable and affordable rates.

Access to Advanced Services. -- Access to advanced telecommunications and information services should be provided in all regions of the Nation.

Access in Rural and High Cost Areas. -- 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.

Equitable and Nondiscriminatory Contributions. -- All providers of telecommunications services should make an

equitable and nondiscriminatory contribution to the preservation and advancement of universal service. Specific and Predictable Support Mechanisms. -- There should be specific, predictable and sufficient Federal and State mechanisms to preserve and advance universal service. Access to Advanced Telecommunications Services for Schools, Health Care, and Libraries. -- Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services as described I subsection (h).

Additional Principles. -- Such other principles as the Joint Board and the Commission determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act.

Section 254 (h) (B) provides that educational providers and libraries shall be assured "affordable access to and use of such services".

The Conference Committee Report further elaborated, "To the extent possible, the conferees intend that any support mechanisms continued or created under new section 254 should be explicit, rather than implicit as many support mechanisms are today.

In addition to the principles above, the FCC adopted the additional principle of "competitive neutrality":

"universal service support mechanisms and rules should be competitively neutral. In this context, competitive neutrality means that universal service support mechanisms and rules neither unfairly advantage or disadvantage one provider over another, and neither unfairly favor or disfavor one technology over another."

This, then, is the framework within which the FCC operates in designing its universal service program. These universal service principles are expected to be implemented in the context of developing a competitive marketplace. Indeed, section 254 is a subsection of Part II of the Act, entitled "Development of Competitive Markets".

DEFINITION OF UNIVERSAL SERVICE: AN EVOLVING LEVEL OF SERVICE

Section 254 (d) of the Act defines "Universal Service" as:

In General. -- Universal Service is an evolving level of telecommunications services that the Commission shall establish periodically under this section, taking into account advances in telecommunications and information technologies and services. The Joint Board in

recommending, and the Commission in establishing, the definition of services that are supported by Federal universal service support mechanisms shall consider the extent to which such telecommunications services --

are essential to education, public health, or public safety;

have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers;

are being deployed in public telecommunications networks by telecommunications carriers; and

are consistent with the public interest, convenience and necessity.

The FCC has defined the basic package of essential services to include: 1. voice grade access to the public telephone network, with the ability to place and receive calls; 2) touch-tone service; 3) single-party service; 4) access to emergency services, including 911 and Enhanced 911 (which identifies a caller's location); 5) access to operator services; 6) access to interexchange services; 7) access to directory assistance; and 8) Lifeline and Link Up services for qualifying low-income consumers.

The Act mandates that the FCC periodically review which communications services should be included in universal service support. At the same time, states are free to establish their own definitions that go beyond federal ones. Even the states that have established the most expansive definitions have not required discounted rates for much beyond basic telephone service; they simply have defined basic services to include touch-tone dialing, access to long-distance carriers, and 911 services.

Although the federal definition currently is drawn rather narrowly, some foresee a day when some services that currently aren't eligible for universal service support will be recognized as essential. For example, the Consumer Federation of America has suggested consideration of the inclusion of toll blocking, directory listing, equitable access to long distance providers, fax/data capability, call trace, telecommunications relay service for the hearing impaired, and advanced switching technology. The National Urban League has argued that the benefits of universal service should be broadened to include educational and developmental nonprofit organizations. Maxine Rockoff, a founder of the Information Technology Initiative at United Neighborhood Houses of New York, goes farther, arguing that the definition of universal service

should be expanded to include at least three new components: access to a computer with a World Wide Web browser, a personal Internet email address, and the capability to make one's own information available via the Web.

IMPLEMENTATION OF UNIVERSAL SERVICE: THE UNIVERSAL SERVICE FUND

The Act provided for the creation by the FCC of a Joint Federal-State Universal Service Board within one month following enactment. Composed of both federal and state representatives, the Board was to make recommendations to the Commission on many aspects of the Act, including the definition of universal service, support mechanisms and timetable.

To implement the universal service funding program, a new set of entities were created, which were subsequently consolidated under The Universal Service Administrative Company ("USAC"). The USAC is a private, not-for-profit organization responsible for providing every state and territory with access to affordable telecommunications services through the Universal Service Fund. USAC administers four programs that assist in carrying out this mission:

- High Cost Program
- Low-Income Program
- Schools and Libraries Program
- Rural Health Care Program

The USAC is the principal federal instrument of the implementation of the sizing, collection and distribution of funds for universal service. It is a subsidiary of the National Exchange Carriers Association, organized by the FCC following the breakup of AT&T. Additional information on its organization and operations can be found at the USAC website.

The Universal Service Fund (USF) was established in 1983 to ensure that all Americans could afford telephone service wherever they live. Until 1996, the USF compensated telecommunications companies that provided service to both low income communities as well as rural areas where the cost of providing service was high. In 1996, the Act mandated that the universal service fund should also provide support for schools, libraries and rural health care providers.

The USF is supported through contributions from all telecommunications companies in the United States, including local and long distance phone companies, wireless and paging companies, and payphone providers.

ACCESS CHARGES: UNSCRAMBLING THE OMLETTE

SLCs and PICCs

Significant increases in local service rates occurred in 1985, 1986, and 1987 with the imposition of subscriber line charges (SLCs), which were flat access charges paid directly by subscribers, in part for long distance usage. These prices were moderated for low-income consumers by the institution of the Lifeline program in 1984 and connection charges by the Link-up program in 1987. These programs are discussed further, below, in the Section on "Low Income Programs". In 1989, the SLC for all residential subscribers to the public switched network rose from \$1.00 to \$3.50.

Following the passage of the Act, the SLC was joined by another charge, called the "Presubscribed Interexchange Carrier Charge" (PICC), in 1998. The PICC was the result of an effort by the FCC to begin to make universal service subsidies more explicit as it made the transition to competition. The Commission restructured interstate access charges, hoping to reduce inflated per-minute rates, by shifting some of those charges to a fixed monthly fee (the PICC).

In the past, the interexchange carriers had always passed on universal service charges to end users -- when charges were exacted on a per-minute basis -- through pass-throughs that were largely invisible to consumers. But this time, those carriers started recovering PICC charges as line items on customer bills, labeled with nomenclature such as "federally mandated universal service charge."

The CALLS Plan

Responding to the need for a revised approach, a coalition of long-distance carriers and local phone companies named "The Coalition for Affordable Local and Long Distance Services" (CALLS) has worked with the FCC to modify the SLC/PICC system.

The centerpiece of the CALLS plan reduces by \$3.2-billion the access charges that long-distance companies pay to local telephone companies in order to use their lines at the beginning and end of a call. The reduction amounts to about a 25 percent cut in access fees paid to the local companies.

The plan folds together the SLC and the P ICC, which now average (combined) about \$5.00 per month. Initially, these two costs are to be consolidated and reduced to \$4.35. But the cost rises to \$5 in July 2000 and could go as high as \$6.50 by 2003, if approved by the FCC.

Industry executives said the savings could range from \$2 to \$4 a month for consumers who make few long-distance calls each month. The FCC touted the overall reduction in access charges of \$3.2 billion as the largest fee decrease ever adopted. The plan, effective July 1, runs for five years. Government officials said they had a commitment from the long-distance companies to pass on the benefits of the savings to consumers. There has been considerable debate as to whether any savings will actually reach consumers.

The FCC said that if companies perform as they should, the cuts would have their biggest effect on the poor and those who use their phones the least. The agency estimates that the reduction in access charges and several other flat fees could result in a savings of as much as \$50 a year for consumers who make no long-distance calls and about \$10 a year for those who make 30 minutes of long-distance calls each month.

A portion of the access fees that long-distance companies currently pay local phone companies goes toward keeping phone service affordable for low-income people and those in high-cost areas. Instead of contributing to this \$650 million fund indirectly, consumers would see the monthly charge for universal service assessed by their long-distance carrier spelled out as a separate charge. Consumers also will see a separate fee from their local phone company, averaging about 36 cents, also used to keep phone service affordable. The FCC said this would help pull "implicit" universal service support out of access charges and to meet Congress' goal of making the support explicit.

More than just a short term solution to a public relations problem, or an intermediate step in adjusting access pricing, the CALLS plan is said to be seen by the FCC as part of an evolution toward a new pricing structure in which long-distance rates will ultimately be like wireless and Internet service rates: either a flat monthly fee or a fee that entitles the customer to a bundle of minutes.

ELIGIBLE TELECOMMUNICATIONS CARRIERS: COMPANIES ELIGIBLE FOR SUPPORT

Universal service funding mechanisms have traditionally been paid to telephone companies, not telecommunications users, based on their costs for serving high-cost customers. To promote competition for these funds, the FCC ruled that any telecommunications carrier, regardless of the technology it uses, is eligible to receive universal service support. However, as recommended by the Joint Board, a telecommunications carrier must meet three criteria to be eligible:

It must offer each of the designated services in the basic package

It must offer the services using their own facilities, or a combination of their own facilities and the resale of services provided by another carrier, and

It must advertise the availability of and charges for the services. The states designate carriers eligible to receive support in part by establishing guidelines for carriers in regards to advertising.

III. HIGH COST SUPPORT: INFRASTRUCTURE, NOT HOUSEHOLDS

The economic reality is that some areas (and states) cost more to serve than others. In these cases, the economic desire to rationalize markets is overcome by the political necessity of serving rural as well as urban areas, and low population states as well as high density states. It is also supported by public policy arguments in favor of serving all comparably, if not identically. So it is appropriate to understand the universal service high-cost support program as a series of political balances, as well as a public policy to subsidize poor rural dwellers. The high-cost support program is an infrastructure support program designed to bring service to certain areas, whether those who dwell in them are rich, poor, or in between. Thus, it inevitably will have -- to take a worst-case example -- the urban poor paying more to underwrite the rich rancher or ski chalet. However, as technology

evolves, policy makers may have more tools to better target support.

But instead of making the same high-cost subsidy available to everyone in a geographic area, the FCC could target the subsidy to consumers who actually need it to afford telephone service. For example, it could provide a greater subsidy to households that qualify for Life-line or Link-up. A way to do this would be to set a lower revenue benchmark for Life-line and Link-up customers and a higher benchmark for everyone else.

High cost support can be sought by companies providing basic "core" telephone service to customers in areas of the country that are relatively more costly to serve. The \$1.7 billion in annual high cost support is raised by charges on long-distance providers, business phone lines, and second lines into residences.

High-cost support goes both to companies that are defined as "rural companies" (those with a total of 100,000 access lines or less) or "non-rural companies" (companies with more than 100,000 access lines). The former includes numerous small, rural independent companies, the latter large companies such as Verizon, Bell South, etc.

The high cost support provides subsidies for small, rural telephone companies that incur the highest costs for servicing lightly populated areas. These high-cost rural carriers currently receive about 87% of current high-cost funding. The plan helps support 31.4 million of the approximately 170 million total U.S. access lines, according to the Universal Service Administrative Co.

In October, 1999, the FCC announced its new rules for high-cost support to non-rural carriers. It concluded that the primary role of federal high-cost support is to enable reasonably comparable rates among states, while the primary role of each state is to ensure reasonably comparable rates within its borders. Based on these federal and state roles, the FCC adopted a new forward-looking methodology for calculating high-cost support for non-rural carriers.

Forward-looking cost approximates the costs that a hypothetical efficient carrier would incur in constructing and operating its network; those costs, minus a "revenue benchmark" taking account of all of a carrier's revenues,

are used to determine the subsidy amount. This approach has been challenged in court. Another issue is that the "study area" used as the basis for developing costs is the entire coverage of the company within the state, which can be quite large -- even the entire state -- and includes both high cost and non-high-cost areas. States do have the option of using a smaller unit of measurement for apportioning funds.

As of April 2000, it was estimated that the aggregate support for non-rural carriers for 1999 would be \$220 million. Combined with additional support from the FCC's "hold harmless" clause, non-rural carriers are projected to receive a total of \$398.9 million in high-cost support for 1999.

There is another aspect of universal service support for incumbents that is worth noting. Incumbent local exchange companies are in many cases burdened with equipment that is outdated and inefficient relative to what could be used if one were starting fresh. Universal service funding to keep prices below costs sustains the use of outdated equipment against more efficient competitors which would likely prevail (at least on price) were the market cost-based. Using universal service to "level the playing field" between incumbents and competitors actually may have the perverse effect of discouraging both competition and innovation. Innovations are unlikely to attract investment if they must compete with established and subsidized "status quo" technology.

It is true that abandonment of support for high-cost areas (as opposed to support for just one line) might raise the costs of local phone service substantially in some areas. But a whole new industry aimed at supplying rural communications service is emerging to attack the high costs underlying such price increases. Although noncabled solutions to the rural telecommunications problem will probably predominate, innovative cabled solutions also hold promise.

The same factors that hold incumbent carriers back from upgrading their systems also serve as a deterrent to would-be competitors. Most of the larger competitive local exchange carriers (CLECs) are focusing their attention on the urban and suburban markets, where the economies of scale are better and there is guaranteed demand for advanced services.

Uncertainties about universal service funding also make the more remote areas less desirable to competitors. While universal service in theory is competitive-neutral, state commissions have not always been quick to designate competitive carriers eligible for universal service support.

IV. LOW INCOME SUPPORT: MEANS TESTING

In addition to the program for support of high cost areas, Congress also provided for support for low-income consumers. The high-cost support is not individually "means tested", whereas qualification for the low-income support programs does involve means testing. The Act strengthened two programs designed to keep basic telephone service affordable for low-income families: Lifeline, which reduces monthly charges, and Link-Up America, which reduces initial connection charges.

The Act, for the first time, introduced the term "affordable" into national telecommunications policy: it provides that quality services should be available at "just, reasonable, and affordable rates". Congress then left it to the Joint Board and the FCC to determine what an "affordable" rate is. In defining affordability, the Joint Board concluded--and the FCC agreed--that: the definition of affordable contains both an absolute component ("to have enough or the means for") and a relative component ("to bear the cost of without serious detriment").

Defining affordability as relative provides the flexibility to ensure that future iterations of universal service have available a permanent mechanism for adjustment to changing conditions. The FCC concluded that the states are the "appropriate fora" for measuring affordability.

The Act also says charges should be "reasonable." Does "reasonable" mean below market? Not necessarily. The Supreme Court, in interpreting the Sherman Act's prohibition against price fixing, has argued that the only reasonable price is a competitive price.

From January 1999 through April 2000, USAC provided approximately \$471 million in Low-Income Universal Service support to Eligible Telecommunications Carriers to offset charges on consumers' bills. All Eligible Telecommunications Carriers must offer the benefit of the low-income programs to their subscribers in order to receive federal universal service support. At present, Lifeline and Link-up discounts for low income residents apply only to home phone service and not to new telecommunications services such as the Internet.

The Lifeline Support Program

The new rules make the contribution and distribution of low-income support competitively and technologically neutral by requiring all providers of interstate telecommunications services to contribute, and allowing all Eligible Telecommunications Carriers, including wireless carriers, to receive support for offering Lifeline and Link Up service. From January 1999 through April 2000, the Lifeline Program distributed \$437,001,327.

Each Lifeline consumer receives \$5.25 per month in federal support. \$3.50 of that total will be automatic; an additional \$1.75 in Federal support will be available with state consent, but without any need for state matching funds. The federal fund will also provide \$1.00 of additional support for every \$2.00 of support provided by the states, up to a maximum of \$1.75, so that the maximum federal support would be \$7.00. The total reduction in a low-income consumers bill, including full state matching funds, would be \$10.50 per month. In the full discount scenario, for every \$3 a consumer sees in rate reduction, the state contributes only \$1 -- and all of these funds remain in state.

In states that do not match FCC funds to lower monthly telephone rates, the FCC adopted eligibility criteria: participants in federal income means-tested programs such as Medicaid, food stamps, Supplemental Security Income (SSI), federal public housing assistance or Section 8, or Low Income Home Energy Assistance Program (LIHEAP) will be eligible for reductions in their phone bills of \$5.25 per month. States that contribute matching funds may set their own eligibility requirements as long as they are income-based.

Link-Up America: Connectivity Support

Link-up America attempts to reduce the entry barrier for new low-income subscribers by paying half the cost of telephone installation and connection charges, up to \$30. Though the participants must again qualify under a state-determined means test, the state is not required to further contribute to reducing the hookup costs. A second part of the program covers the interest charges for any deferred payment plan on installation and startup costs that the telephone company provides (within specified limits). From January 1999 through April 2000, the Link-up program distributed \$34,012,031.

Link-Up customers are still be responsible for security deposits and can only apply the discounts to a single residential telephone line. Link-Up participants must meet the qualifications determined by their state commission. In states that do not have a state program, consumers must participate in one of the following programs to qualify: Medicaid, Food Stamps, Supplemental Security Income, Federal Housing Assistance and Low Income Energy Assistance Program.

Low-income consumers may choose any qualified carrier using any technology to provide basic service. They will receive free toll blocking and toll limitation services and will not lose basic telephone service if they are unable to pay for toll charges. There is no restriction on the number of service connections per year for which a low-income consumer can receive Link-Up support.

V. THE E-RATE: SCHOOLS, LIBRARIES, AND RURAL HEATH

Schools and Libraries

The Act added something entirely new to the "traditional" understanding of universal service. Stepping beyond the established areas of support for rural infrastructure and low income households, it added support for schools (K-12), libraries and rural health care facilities.

However, it is important to note that this support is fundamentally different than the preceding models (Link-Up and Lifeline). Funding under this provision, commonly called the "E-rate" is directed entirely at supporting "Advanced Services". The E-rate is not about telephone service -- it is about providing "affordable" access to the Internet and broadband digital services. In this regard, it sets an important precedent.

The Schools and Libraries Universal Service Program was established with the express purpose of providing affordable access to advanced telecommunications services for all eligible schools and libraries, particularly those in rural and inner-city areas.

Funded at up to \$2.25 billion annually, the Program provides discounts of 20% to 90% on telecommunications services, Internet access and internal connections. The level of discounts schools and libraries are eligible to receive depends on economic need and location, rural or urban; once approved, they apply their discounts to

telecommunications services, Internet access and internal connections, then pay the difference out of their own budgets. The Program's deepest discounts go to rural and inner-city communities where the need for modern telecommunications services is most pressing. The discounts cover Internet access and many other telecommunications services, as well as equipment such as inside wiring, servers, and routers. Schools and libraries are required to apply for discounts for the telecommunications services they want to use. Schools and libraries submitted approximately 36,000 completed applications, requesting an estimated \$4.72 billion in discounts for year three of the program (July 1, 2000 to June 30, 2001). In cases where demand by schools and libraries exceeds the level of funding available, the Commission concluded that the best approach is to provide full support for recurring services, such as telecommunications services and Internet access, and to direct support for internal connections to the most disadvantaged schools and libraries.

E-rate funding comes from mandatory contributions to the Universal Service Fund by all telecommunications companies (local and long-distance carriers, reseller, cellular, paging, other wireless and any other companies that interconnect with the switched network, but not currently Internet, on-line service and cable telecommunications companies. To pay for the \$2.25 billion program, providers of interstate telecommunications services are being assessed 0.57% of their intrastate, interstate, and international end-user revenues. They are also being assessed 3.05% of their interstate and international end-user revenues to support the high-cost and low-income subscriber universal service programs. Schools and libraries are required to submit their requests for services to the universal service fund administrator, who would then calculate the discount the school or library is eligible to receive (see matrix below) and post that information along with a description of the services sought on a website for all providers of services to see. The school or library will then have to wait four weeks to allow time to get a number of competitive bids. All Eligible Telecommunications Carriers may bid. The companies that bid to provide services are required to offer their lowest corresponding price and no more. After four weeks, the school or library may enter into a contract contingent on them receiving their universal service

support. A copy of the contact will be sent to the universal service fund administrator for final approval and to determine if there are enough available funds. Schools and libraries may not resell any discounted services. The prohibition on resale, however, will not prohibit either computer lab fees for students or fees for Internet classes.

Rural Health Care Support

Congress took note of the potential importance and benefits of telemedicine in serving areas that otherwise may not be well served by the medical community. Again, this part of the Act sets some interesting precedents with respect to paying for high bandwidth, Internet access and instruction. The Act says that telecommunications providers shall supply services to public and nonprofit health care providers that serve rural residents at rates reasonably comparable to rates charged in urban areas. This includes "services which are necessary for the provision of health care," as well as instruction related to those services.

The FCC's rules provide for all public and not-for-profit health care providers located in rural areas to receive universal service support, not to exceed an annual cap of \$400 million. A health care provider may obtain telecommunications service at a transmission capacity up to and including the bandwidth equivalent of a T-1 line at rates comparable to those paid for similar services in the nearest urban area within the state with more than 50,000 residents.

Rural health care providers may receive support for both distance-based charges and a toll-free connection to an Internet service provider. Each health care provider that lacks toll-free access to an Internet service provider may also receive the lesser of 30 hours of Internet access at local calling rates per month or \$180 per month in toll charge credits for toll charges imposed for connecting to the Internet.

VI. ADVANCED SERVICES AND THE INTERNET: AFFORDABLE ACCESS FOR ALL

As noted above, the Act contemplates not only a new universal service regime of telephony, but expressly requires a migration to the provision of "advanced services". Section 254(b)(2) provides that: "Access to advanced telecommunications and information services should be provided in all regions of the Nation" and subsection (3) requires that "low-income consumers and those in rural, insular, and high cost areas" should have access to them.

Section 706 of the Act provides that:

In General. -- The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.

The Commission is instructed to "accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market". The Act then offers a definition:

Advanced Telecommunications Capability. -- The term "advanced telecommunications capability" is defined, without regard to any transmission media or technology, as high-speed switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.

It is significant that this definition is technology neutral and described in terms of functionalities rather than specific types of technology.

The FCC has further defined broadband as "having the capability of supporting, in both the provider-to-consumer (downstream) and the consumer-to-provider (upstream) directions, a speed (in technical terms, 'bandwidth') in excess of 200 kilobits per second (kbps) in the last mile."

Advanced services are currently being "rolled out" by cable television companies, telephone companies, and new digital networks, including satellite and wireless. Based on digital, packet-switched technology, it is indifferent to the means of transport and delivery. It appears the entire national and global telecommunications network is migrating over time towards this model. This includes rural areas and inner cities.

For historical reasons described in the Frieden paper, the Internet and Internet Service Providers (ISPs) are not subject either to regulation as telecommunications common carriers, or to required "contributions" in support of universal service. Information providers -- companies that provide websites and Internet content -- are also outside this domain, and, arguably, are protected by the First Amendment, creating complications in addressing fully integrated operations.

Advanced Services

The construction of broadband advanced services infrastructure in urban and affluent areas appears to be moving quickly based on market responses to demand, and does not appear to need any special support. The primary concerns are high-cost areas. The extent to which the market is responding to demand in those areas -- which is reportedly as high as it is in urban areas -- is a matter of debate. The Clinton Administration released a report entitled "Advanced Telecommunications in Rural Areas," in which the administration said that the cable and telephone industries are focusing most of their broadband deployment on urban areas, bypassing rural regions. The report notes that cable broadband is available in more than 65 percent of U.S. cities with populations above 250,000. In addition, it says phone-company-delivered broadband is offered in 56 percent of cities with populations above 100,000. However, less than 5 percent of towns with 10,000 residents or less have access to either technology.

According to another report, "Breaking the Backbone," released by the Economic Strategy Institute, rural America is in danger of being left behind as the rest of the country forges ahead into the digital future. Residents of twelve states - the "Disconnected Dozen" - are particularly at risk of being deprived of the broadband services that are becoming widely available to urban and suburban dwellers, such as DSL and cable modems. These twelve states are said to have significantly fewer hubs than other states on a per-capita basis and to be at serious risk of falling behind in the digital economy. The States identified as at highest risk of falling by the digital wayside are: Alabama; Arkansas; Idaho; Iowa; Maine; Montana; New Hampshire; North Dakota; Oklahoma; South Dakota; West Virginia; and Wyoming.

In addition to whatever support might be offered by future universal service mechanisms, there are additional resources that are being brought to bear to provide access to advanced services to all areas.

The 1996 law established a Telecommunications Development Fund (TDF) to make loans to small businesses to promote competition in telecommunications and to stimulate new technology development. The federal government also identified the National Educational Technology Funding Corporation as an organization that could help states leverage funds for educational technology.

These new agencies join others that already have been encouraging more widespread access to the communications tools of the digital age. Since 1994, the Telecommunications and Information Infrastructure Assistance Program (TIIAP), part of the Commerce Department's National Telecommunications and Information Administration, has awarded 332 grants totaling more than \$100 million for projects aimed at helping nonprofit hospitals, tribal and local governments, libraries, schools, and community centers use information technologies.

The Department of Housing and Urban Development (HUD) devised the Neighborhood Networks Initiative to provide training and access for residents of HUD-financed properties. Neighborhood Networks supports the development of community technology centers in public housing.

The U.S. agriculture Department's Rural Utilities Service (RUS) has proposed updating its rules to make it easier for telecom carriers to obtain financing for the deployment of advanced services in rural areas. Under the proposal, RUS would have authority to grant loans to carriers that agree to become "eligible telecommunications carriers" (ETCs) or to act as ETCs. The Telecommunications Act of 1996 defines an ETC as a carrier that's certified by a state regulatory commission, provides certain basic service levels, and is eligible for support from the Universal Service Fund. RUS earlier suggested rule changes to make wireless carriers eligible for loans, even if they didn't provide basic telecom service.

The Internet

The discussion of advanced services seems to assume "the Internet" as an underlying premise. However, the Internet is both a physical network and a network defined by Internet Protocol (IP), which can be used on the public

Internet, commercial telecommunications networks, or private institutional networks. As over-the-air broadcasting confused the technology (big metal towers) with the content (programming distributed by national networks), so there is a tendency to confuse the physical infrastructure of the Internet with its capabilities. This is compounded, as it is not simply a matter of transport and content, but a technology with multiple levels (protocol stacks) to which different kinds of functionalities may attach.

The Frieden paper sets forth the regulatory issues and complexities created by the Internet. Once again, we have situation where policy makers are burdened with a particular history -- in this case, the development of the Internet outside of the regulatory and universal service regime. But now the Internet, embodied as "advanced services", seems about to swallow the entire traditional telecommunications regime, and a great deal besides (such as traditional over-the-air broadcasting). The FCC is well aware that the old regulatory categories, structures and rules will not work in this new environment, and this applies to universal service as well.

Congress, in the Act, indicated its intention that universal service should evolve, and that advanced services should be a part of that vision. However, a regime in which a growing "Voice over IP" (also known as Internet telephony) market, and Internet Service Providers (which often also provide facilities), make no contribution to universal service is a situation which is not compatible with the intent of Congress and cannot be sustained. As services migrate in this direction, fewer and fewer companies will bear a greater and greater share of the burden, leading to asymmetries and ultimately the failure of the current mechanism if it is not revised.

Once again, there are values in conflict. Advanced services should, over time, be made available on the basis described by Congress. But to integrate them into a universal service regime will necessarily impose some costs on the Internet. At the same time, the Internet has been a powerful engine of economic growth, and there is a strong sense that it should not be disturbed. However, if costs are spread widely enough, the incremental burden on the Internet will be nominal.

The "Basket of Services" Approach

In a digital, packet-switched, Internet-modeled "advanced universal services" regime, consumers will be offered bundles of services by competing providers (or possibly sole providers). These will include the equivalent of traditional local and long-distance voice services, wireless services, video cable-TV equivalent services, Internet access and probably numerous other hardware, software, network, access and content services in as yet unimagined configurations. Under the "basket of services" approach proposed by these papers, the households or consumers supported by universal service should be able to pick and choose those services that make the most sense for them.

From the point of view of the providers, the delivery system should be technologically neutral - a copper telephone phone line, co-axial cable, fiber optics, terrestrial wireless, satellites - it should all be transparent, since they are all providing the same functionality, the delivery of packets of bits. The packaging and pricing of such services may look nothing at all like the pricing of traditional telephony services - indeed "voice" service may be included in some packages "free".

From the point of view of the consumer, the delivery system is also irrelevant. He or she wants the functionalities and content deemed necessary, and is indifferent to the means of their delivery. But unlike the simple, traditional, circuit-switched voice telephony, delivering the digital bundle involves far more layers of players and complexity. How, then, should the old method of funding universal service, which looks primarily to traditional telecommunications carriers, be adapted to this new regime?

To provide universal access to advanced services will require incorporating into both the "contribution" and ETC chain all the entities which provide hardware, software or services that make access possible and that provide the functionalities desired by the user (holding for future discussion "pure content" services). Any entity which is technically necessary for access, or which is in the "value chain" of directly or indirectly providing necessary

services to, and receiving income from, the user, must be a part of the expanded universal service pool.

At its broadest, this could include equipment manufacturers, software producers, traditional broadcast television as it becomes digital, cable telecommunications and "broadband" networks, as well as the entire Internet chain of ISPs and backbone and service providers. If all of these companies were to pay a small percentage of their revenues, the added burden on the price of using the Internet for the general population would be so widely distributed as to be insignificant. But it would still not be a "tax" raising general revenues from the population at large, and subject to the uncertainties of the annual national budget process, which could make investors wary.

Such an approach, while arguably within the jurisdiction of the FCC, would be best served by a refreshed Congressional mandate in the form of an amendment to the Act which would make it clear that it is prepared to take the necessary steps to assure its policy goals are met.

VI. PRINCIPLES FOR MIGRATION TO A "UNIVERSAL ADVANCED SERVICES" POLICY TO BRIDGE THE "DIGITAL DIVIDE"

The current universal service regime needs to move forward with a vision of where it is going. There will be a transition period during which additional legislation will be needed, and new regulations will be issued. The following are some general principles for reference as the advanced universal service regime evolves. A successful advanced universal service program should:

Promote Competition

- Eliminate unnecessary or counterproductive regulations
- Aggressively promote competition
- Let the market do as much as it can
- Create incentives for efficiencies
- Avoid distorting effective price competition
- Inform potential users of availability and benefits
- Prefer subsidies and incentives to price controls
- Focus on network capabilities (functionalities) rather than specific technologies
- Attach costs properly to services
- Those who create costs should be the ones to bear them

Costs process must be transparent/fair (all see costs and allocations)
Avoid paying more than the true market price for subsidized services
Do not impede technological innovation

Be Narrowly Tailored

- Target narrowly high cost and low-income subsidies
Do not subsidize technologies/services for which there is no demand
Make the subsidy as small as necessary to accomplish the goal

Be Neutral

Competitive neutrality
Structural neutrality (not favor integrated or unbundled services)
Technological neutrality
Applications and content neutrality
Geographic neutrality (not disproportionately burden any part of the country)
Transitional neutrality (no negative shocks or windfalls due to transition)
Jurisdictional neutrality (should integrate into the federal-state regulatory system)
Neutrality as between purchase of services over end-user equipment

Be Politically Viable

No one involuntarily loses current telephone service.
Those who wish to do so may keep it indefinitely
Build on existing programs - no drastic changes
Recognize geographical differences (population density and income)
Maintain appropriate jurisdictional roles
Create a role for non-profits, community groups, co-ops, demand aggregators, public-private partnerships.
Be flexible during transition

VII. CONCLUSIONS

The current universal service funding program under the Act is functioning for the time being despite some serious internal contradictions. These are being addressed on an ad hoc basis by the FCC and the courts, possibly delaying

the introduction of full competition and creating some economic inefficiencies.

The internal tensions of the current provisions, however, pale in comparison to the leap that will be required to extend the universal service regime, as Congress has directed, to advanced services. That process will require both major regulatory restructuring, and a new level of policy thinking about the "content" of universal service.

The Schement article has established the public policy foundations for such a new vision of universal service, based on a "basket of services" approach. The Frieden article has addressed the changes that have to be made to create a regulatory regime broad enough and fair enough to encompass the sweeping technological and business changes that are underway.

This article has attempted to provide a context for understanding the challenges of funding a new vision of universal service. There is a substantial history of policy being embodied in regulatory and economic structures that must be transformed. However, the present framework for distribution of funds through high cost infrastructure support and low-income support can be adapted -- in ways foreshadowed by the E-rate -- to accommodate the new vision of universal service. This can be done incrementally, as both markets and regulatory models evolve.

However, it will require both the FCC and Congress to revisit and renew their thinking about the scope of those companies which contribute to universal support, and the role of those companies which contribute either to the chain of customer access and use, or to the basic "universal service" basket as potential contributors.

Radical re-imagining of the finance mechanism does not seem to be required. For those few areas and groups not reasonably and affordably served by the market, the new vision of universal service proposed in these papers can be provided by the evolution of existing mechanisms, as Congress intended.

At present, the universal service fund for high cost/low income support is collected from mandatory contributions from all interstate telecommunications

carriers, and for the e-rate from all telecommunications carriers providing service within a state. This does not include, for example, intrastate carriers, wireless companies (in most circumstances), cable modem services, ISPs, or content services.

In an advanced services environment, all carriers or entities that can provide the necessary functionalities should be eligible for universal service funds. Correspondingly -- to maintain symmetry -- all those who are eligible for funds should contribute. The contributions are based on a percentage of gross revenues.

This means expanding the program to include contributions from cable telecommunications services, digital wireless services and ISPs, to the extent they provide telecommunications services, serve as a gateway to the Internet, or use telecommunications unbundled network elements. As long as ISPs are in the value/payment chain for an end-user's access to the Internet, add costs to the network, and benefit from universal service funds, they should contribute. A distinction should be made between the ISPs role as a content provider and an access service provider. So far, there is no precedent for asking content providers to contribute to universal service, although discussion on the subject should not be foreclosed. This approach would be more fair and competitively neutral, and since all those who benefit also contribute, the contribution of any one entity will be relatively lower. Such an approach will probably need an expanded Congressional mandate.

The Problem of Residential Underpricing

One of the fundamental problems is that a large percentage of residential customers (in some areas, perhaps as much as 80%) have been receiving basic telephone service below cost, from local incumbent monopolies that have been receiving universal service cross-subsidies to high-cost service areas. To make these customers attractive to potential local competitors, either their rates have to rise to cost or above, or the competitors must get equally large subsidies. If the remaining customers in these areas had to bear the burden of these subsidies, their rates would have to be far above cost, making them attractive to "cherry picking" competitors.

One alternative solution is to increase the "take out per home", that is, the total monthly bill, to a profitable level by selling additional non-basic services, and, eventually, a bundle of services of which "voice" is only a part. But do we want companies that will only sell expensive bundles of services and not offer an inexpensive basic service equivalent to today's residential telephone service?

The short-term reality, however, is that the incumbent local exchange carriers, and by necessary implication, their shareholders, are being stuck with a large part of the bill. They are responding with litigation, asserting that their property is being unconstitutionally taken, and having, so far, some success. This could delay and/or impair the desired model for competition, and consequently, for an updated/expanded vision of universal service funding.

Total Element Long Run Incremental Cost (TELRIC)

The FCC issued its Local Competition Order in August 1996, six months after the passage of the Act. One of the requirements of the order is that incumbent local exchange carriers must lease to their competitors any combination of network elements, including the complete platform, at prices equal to forward looking economic cost. That is, how much would it cost an efficient competitor using today's equipment at today's prices to provide these elements.

So from the point of view of the FCC, attempting to implement the will of Congress to promote competition, TELRIC pricing is a positive and rational step. The problem is that it does not address the issue of historic costs. Finding no relief on this issue at the FCC, the telephone companies have turned to the courts.

Court Cases Challenging TELRIC: The 8th Circuit Case - Iowa Utilities Board et al. v. FCC; The 5th Circuit Case - GTE Corp. et al. v. FCC et al. There does not appear to be any solution to these historic costs that is politically and regulatorily acceptable. (Footnote regarding difficulties of sizing such costs.) Recognizing such costs would impair the federal policy of competition and result in higher rates -- both of which outcomes are not acceptable. Thus, it will apparently be left to the courts to resolve. This however, will likely mean delays in the introduction of competition, and, possibly, higher costs for universal service. Another approach would be to build these costs into universal service costs (that are passed on directly to consumers) as part of the "universal service" line item. However, they would be paid out only to incumbents, not to competitors (who do not have any "stranded" costs). This would be mechanically workable, but would distort the universal service payments process.

A variation of that would be to use a mechanism similar to the universal service mechanism, but have a separate surcharge on customer bills (the approach evidently preferred by GTE). Or, it might be possible to make such a charge "virtual" (i.e., non-explicit to consumers) by creating a structure of internal transactions between carriers. (footnote Noam's net trans recommendation).

In a pure market model of telecommunications services, every user would pay exactly the cost of providing the service, plus a little profit. In a pure equality model, every user would pay exactly the same amount, no matter what the cost of the service. Congress had decreed that there shall be both competition and universal service. The traditional model is more like the equality model. The new model is more like the competitive model. In the competitive model, prices to customers should realistically reflect the cost of providing them service. Adjusting the existing system to reflect the new reality is called "rate rebalancing". This works at the local, state and national level.

Methodology for Calculating Support:

Beginning on January 1, 2000, the FCC's universal service cost model has been used to estimate the forward-looking costs incurred by non-rural carriers to provide supported services.

The statewide average cost per line for all lines served by non-rural carriers in a given state will be compared to a national cost benchmark, set at 135 percent of the national average forward-looking cost per line.

The new federal high-cost support mechanism will provide support to non-rural carriers in a state where the statewide average cost per line exceeds the national cost benchmark. The federal support mechanism will provide support for all forward-looking intrastate costs per line that exceed the national benchmark. The new federal mechanism takes into account the FCC's separations rules and the division of cost recovery between the state and federal jurisdictions, and therefore provides 76 percent of the portion of the forward-looking costs of providing the supported services.

Interim Hold-Harmless Provision:

The interim hold-harmless provision ensures that the amount of support provided to a carrier by the forward-looking mechanism will be no less than the amount of support provided to the carrier by the present mechanism.

The interim hold-harmless approach is designed to prevent potential rate shocks and disruptions in state rate designs when the forward-looking mechanism takes effect.

Interim hold-harmless support is determined on a per-line basis; if a carrier loses a line, it loses the support for that line. Hold-harmless support is targeted, based on wire center costs, to the highest cost wire centers.

Portability of Support:

Federal universal service support will be portable among all eligible telecommunications carriers. When a competitor acquires a subscriber line from an incumbent receiving support, the competitor will receive the incumbent's support.

As part of the application process, the school or library must first conduct a technology inventory and assessment that will provide information on the applicant's current capacity and future plans regarding:

the availability of computer equipment and modems;

internal network connections and volunteer efforts to install these connections;

the software necessary for computer communications;

the experience level and training programs available for staff that will be making use of the technology;

computer maintenance contracts;

the institution's electrical system;

specific plans for using the technology and for integrating it into their curriculum.

Several bills have been introduced in the Senate that propose varying forms of financial assistance to carriers that build broadband networks in unserved areas. Jay Rockefeller (D-W.Va.) and Olympia Snowe (R-Me.) sponsored a measure that would create a tax credit for companies that invest in rural broadband facilities, while Byron Dorgan (D-N.D.) introduced a low-interest loan proposal. Meanwhile, Rep. Billy Tauzin (R-La.), chairman of the House telecommunications, trade and consumer protections subcommittee, has advocated deregulating the Bells' provision of interLATA data services.

. The fund, which will operate as a nonprofit corporation and will be capitalized with interest earned on money raised in spectrum auctions, can be used "to support universal service and promote delivery of telecommunications services to underserved rural and urban areas."

^ This sweeping vista is often attributed to Roosevelt's first inaugural, when he addressed a people frightened by events out of their control. Instead, the line comes from his second inauguration in 1937, at a time when the Great Depression was inching up on the way to recovery. Roosevelt wanted to keep Americans focused on the work still to be done. As a stand alone sentence, it captures his penchant for balanced prose and visual phrases. By the way, 1937 represents the first time a president was sworn in on January 20.

^ Universal access and Universal Service can almost be considered synonyms, In policy discourse authors and speakers sometimes interchange them in the same sentence. If this continues, then an older and useful distinction will be lost. Until recently, users commonly spoke of "universal access" to mean the availability of connectedness for all; thus, universal access might denote the distribution of the railroad network or the ease with which a person might receive telephone service. "Universal Service," in turn, denoted a policy to achieve universal access in a specific medium; for example, the long-term commitment to the provision of free mass education, and the financing system to support it. In this paper, we try to adhere to that older usage.

^ Constitutional Antecedents. Rights related to information and communication are not new in American civic consciousness. In the Constitution, the founders promoted a view of government as a necessary collector, processor, and disseminator of information by instituting a decennial census (Article I, Section 2) and establishing a Congressional record (Article I, Section 5). The founders also paid special attention to the information infrastructure by granting Congress the power "to establish post offices and post roads" (Article I, Section 8). And, they envisioned government as a supporter of new knowledge, as well as a protector of the intellectual property generated by scientists, inventors, and authors (Article I, Section 8). In the Bill of Rights they extended their sensitivity to communication. With the ratification the First Amendment, 18th Century Americans registered their anxieties that speech, association, and belief deserved special protection. When, in the Fourth Amendment, they underscored their concern for protecting the privacy of

citizens, they singled out papers as meriting special protection from "unreasonable searches and seizures."

^ Some notes on the declining cost of ownership. In 1996, few computers sold in the retail market cost less than \$1,000. In 1997, sub \$1,000 PCs constituted 48.4% of retail PC sales, up from 1.2% in 1996. Computers over \$2,000 now constitute less than 8% of retail PC sales. This huge reduction in the price of PC ownership is expected to continue and has encouraged rapid household penetration in the US. (See, J. Kirchner, "PC Prices: How Long Can They Go?", PC Magazine Online, March 10, 1998 at <http://www.zdnet.com/pcmag/issues/1705/283015.htm> and "Expensive PCs Face Challenge" by Todd Wasserman, Computer Retail Week using International Data Corporation (IDC) data, June 15, 1998.) Over 80 million people in the US will be online in 2002, nearly one in three people, and more than half of all households. (See, "Warner Brothers Melds DVD, Internet, TV" by Andy Patrizio, Techweb, June 24, 1998.) ActivMedia projects that the numbers will be even larger—it speculates 150 million people in the US will be online in 2000, over half of the world's total of 279 million the same year. (See, Special Studies: Electronic Commerce and the Role of the WTO, World Trade Organization, 1998, Chart 8.) Thus while cost is a limiting factor in PC penetration, PCs are quickly approaching the cost of a standard color television—a device boasting a 99% penetration rate in the United States and above 80% penetration rates in most Western countries.

^ Closing the Digital Divide, Tomas Rivera Policy Institute, 1998.

^ Perhaps the most promising destroyer of access gaps is the proliferation of Internet Service Providers (ISPs) offering the public access to the global network of networks. Exempted from access charges since the 1983 FCC ruling that categorized them as enhanced service providers (ESPs), ISPs have used flat rate pricing structures to entice consumers to "get online". The scheme has worked. Over 80 million people in the US will be online by 2002 if growth rates continue unabated—nearly one in three people and more than half of all households.

^ See Booker, E. (1986). Lifeline and the low income customer: Who is ultimately responsible? Telephony, 210(20), 116-132. Dordick, H. S. (1990). The origins of

universal service. *Telecommunications Policy*, 14(3), 223-238. Dordick, H. S., & Fife, M. D. (1991). Universal service in post-divestiture USA. *Telecommunications Policy*, 15(2), 119-128. Gilbert, P. (1987). Universal service on hold: A national survey of telephone service among low income households No. US Public Interest Research Group. Hills, J. (1989). Universal service: Liberalization and privatization of telecommunications. *Telecommunications Policy*, 13(2), 129-144.

^ See Perl, L. J. (1983). Residential demand for telephone service 1983 No. 1). National Economic Research Associates, Inc. for the Central Services organization, Inc. of the Bell Operating Companies. Hausman, J., Tardiff, T., & Belinfante, A. (1993). The effects of the breakup of AT&T on telephone penetration in the united states. *The American Economic Review*, 83(2), 178-184. Schement, J. R. (1994). Beyond universal service: Characteristics of americans without telephones, 1980-1993 Communications Policy Working paper No. 1. Benton Foundation. Schement, Jorge Reina [1998] "Thorough americans: Minorities and the new media," Investing in Diversity: Advancing Opportunities for Minorities and the Media. Aspen Institute Publication, Washington DC, 87-124. Schement, Jorge Reina, Belinfante, Alex, and Povich, Laurance [1997]. "Trends in telephone penetration in the united states 1984-1994." In E. M. Noam & A. J. Wolfson (Eds.), *Globalism and Localism in telecommunications*, (pp. 167-201). Amsterdam, The Netherlands: Elsevier. Mueller, Milton, and Schement, Jorge Reina [1996] "Universal Service from the Bottom Up: A Study of Telephone Penetration in Camden, New Jersey," *The Information Society*. Vol. 12, 273-292. Schement, Jorge Reina [1995] "Beyond universal service: Characteristics of americans without telephones, 1980-1993," *Telecommunications Policy*. Vol. 19, No. 6, 477-485. Williams, F., & Hadden, S. (1991). On the prospects for redefining universal service: From connectivity to content Policy Research Project: The University of Texas at Austin. Williams, F., & Hadden, S. (1992). On the prospects for redefining universal service: From connectivity to content. *Information and Behavior*, 4, 49-63.

^ See Schement, Jorge Reina [1998] "Thorough americans: Minorities and the new media," Investing in Diversity: Advancing Opportunities for Minorities and the Media. Aspen Institute Publication, Washington DC, 87-124. Schement, Jorge Reina, Belinfante, Alex, and Povich,

Laurance [1997]. "Trends in telephone penetration in the united states 1984-1994." In E. M. Noam & A. J. Wolfson (Eds.), Globalism and Localism in telecommunications, (pp. 167-201). Amsterdam, The Netherlands: Elsevier. Schement, Jorge Reina [1995] "Beyond universal service: Characteristics of americans without telephones, 1980-1993," Telecommunications Policy. Vol. 19, No. 6, 477-485. But also consult (1995) Falling Through the Net: A Survey of the 'Have Nots' in Rural and Urban America" National Telecommunications And Information Administration, U.S. Bureau Of The Census, U.S. Department Of Commerce. Washington DC. (1998) Falling Through The Net II: New Data On The Digital Divide. National Telecommunications And Information Administration, U.S. Bureau Of The Census, U.S. Department Of Commerce. Washington DC.

^Series E 135-166, G 416-469 (1975). Historical statistics of the united states, colonial times to 1970. Washington DC: GPO. Table 708, 738 (1981). Statistical abstract of the united states: 1981. Washington DC: U.S. Bureau of the Census. Table 676 (1987). Statistical abstract of the united states: 1988 . Washington DC: Bureau of the Census.

^Brooks, J. (1975). Telephone: The first hundred years. New York: Harper & Row, p. 65.

^Belinfante, A. (1993, July). Telephone subscribership in the United States. (CC Docket No. 87-339). Federal Communications Commission.

^ P.L. 73-416, 73rd Cong., 2nd Sess. `SEC. 254. UNIVERSAL SERVICE.

^Federal Communications Commission (1995, May). Monitoring report: CC Docket No. 87-239. Washington, DC.

^See Mueller, M. & Schement, J. R. (1995). Universal service from the bottom up: A profile of telecommunications access in Camden, New Jersey. New Brunswick, NJ: Rutgers University Project on Information Policy. Horrigan, J. B. & Rhodes, L. (1995). The evolution of universal service in Texas. Austin, TX: Lyndon B. Johnson School of Public Affairs. Southwestern Bell Telephone Company (1987, May). Economic analysis of subscriber line charges. St. Louis: MO. See also, Chesapeake and Potomac Telephone Company (1993, October). Telephone penetration project: Door -to-door survey. Washington, DC: Author.

^Mueller, M & Schement, J. R. (1995). Universal service from the bottom up: A profile of telecommunications access in Camden, New Jersey. New Brunswick, NJ: Rutgers University Project on Information Policy. Horrigan, J. B. & Rhodes, L. (1995). The evolution of universal service in Texas. Austin, TX: Lyndon B. Johnson School of Public Affairs.

^ For the original, see Gertrude Stein's declaration, "Rose is a rose is a rose." in Sacred Emily.

^ A note on Plain Old Telephone Service (POTS) is the baseline for American universal service policies, with all other technological options considered extensions of that base. The term POTS may give the impression of an unchanging primitive system as the base for all other enhancements; however, that would be misleading. In the US, POTS has evolved from live operators placing calls individually to a completely automated system that utilizes satellite relays and computerized switches. It may be "plain," but its technology has been ever changing.

^ Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey. *The Information Society*, 12, 273-292.

^ Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone penetration in Camden, New Jersey. *The Information Society*, 12, 273-292. Schement, J. R. (1998). Thorough americans: Minorities and the new media. In A. K. Garmer (Ed.), *Investing in diversity: Advancing opportunities for minorities and the media*, (pp. 87-124). Washington DC: The Aspen Institute.

^ Perhaps it goes without saying, but the regulatory regime and the funding system should aim to encourage bundling.

^ "Slamming" is the illegal practice of switching an individual's long-distance carrier without the individual's full consent. It appears to be especially prevalent in minority, immigrant, and non English-speaking communities.

^ Mueller, M. L., & Schement, J. R. (1996). Universal service from the bottom up: A study of telephone

penetration in Camden, New Jersey. The Information Society, 12, 273-292.

^ Schement, Jorge and Forbes, Scott C. [1999] "Local Dimensions of the persistent gap in telecommunications," International Communication Association, San Francisco, CA , May. Schement Jorge Reina [1998] "Telephone penetration at the margins: An analysis of the period following the breakup of at&t, 1984-1994." In H. Sawhney & G. A. Barnett (Eds.), Progress in communication sciences, volume xv: Advances in Telecommunications, (pp. 187-215). Stamford, CN: Ablex.

^ AOL now offers two services in the US: AOL and CompuServe, with different marketing schemes. In Europe, AOL offers three services: AOL and CompuServe, both subscription-based, and Netscape Online, a free Internet service to combat smaller free ISPs. See TechWeb's article: "AOL Wants It Both Ways With Free Service", August 24, 1999 by Guy Middleton.

^ Table 15.1, p.70.

^ In comparison, 98.3% of households own televisions. U.S Bureau of the Census (1997), p.566.

^ Monitoring Report, May, 1997, Table 1.2, p. 21.

^ Monitoring Report, May, 1997, Table 1.7, p. 50.

^ Monitoring Report, May, 1997, Table 1.9.

^ Monitoring Report, May, 1997, Table 1.7, p. 50.

^ Page 90.

^ Interview data support the archival data gathered by the PacTel/GTE study.

^ Companion Services are user-oriented services native to the connecting technology that facilitate communication and information transfer. These services currently include voice mail, teleconferencing, email, and recently such innovations as universal messaging and internet telephony.

^ Electronic Commerce for our purposes includes those online services which require the Internet and the World

Wide Web (WWW). It should not be confused with teleservices, an example of which includes remotely checking your bank account from a telephone.

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