ORIGINAL

Memorandum

From the office of
Commissioner Andy Tobin
Arizona Corporation Commission
1200 W. WASHINGTON
PHOENIX, ARIZONA
(602) 542-3625

TO: Docket Control

DATE: March 20th, 2017

FROM: Commissioner Andy Tobin's Office

SUBJECT: Arizona Universal Service Fund RT-00000H-97-0137

Commissioner Tobin's office received the following Arizona Universal Service Study 1995 and docketed.

Please visit here to view the Arizona Universal Service Study.

Kelly Johnson

From:	Mark Goldstein <markg@researchedge.com>
Sent:	Tuesday, March 07, 2017 10:44 AM
To:	Andy Tobin
Cc:	Forese-Web; Little-Web; Dunn-Web; RBurns-Web; Milan Eaton; 'Muralidharan Mala'; 'Brenda Beall'
Subject:	Commissioner Andy Tobin/ACC: ATIC's AUSF Testimony & 1995 Arizona Universal Service Study
Attachments:	Arizona Universal Service Study 1995.pdf

Commissioner Tobin,

I was pleased to testify before the Commission last Thursday on behalf of the Arizona Telecommunications & Information Council (ATIC) reflecting our unmitigated support of the evolution of the Arizona Universal Service Fund to help leverage FCC e-rate funding for construction of broadband infrastructure to rural K-12 schools and libraries. The Commission has done great work and Milan Eaton, Muralidharan Mala, and staff have provided a solid framework for a successful roll out going forward. Kudos to you all!

As mentioned, Governor Fife Symington convened a commission in 1995 that produced an Arizona Telecom and Information Industry Study that was forward looking and seminal to subsequent Arizona broadband progress. From the recommendations of that report (copy available on request), ATIC evolved from an earlier name/form and ramped up our activities and stakeholder engagement, the Governor created a Telecom Policy Office (TPO), and the new TPO contracted with my firm, International Research Center, to research and author a national universal service study of states' programs and strategic thinking.

That study, "Universal Service to Universal Access: The Paradigm Shift in Citizens' Use of Telecommunications" is attached and informed the ACC's design and creation of the Arizona Universal Service Fund (AUSF). It anticipated the need for eventual support of broadband services over 20 years ago, though perhaps not in the specific way that we are advancing today. Please share with the other Commissioners and staff as appropriate and archive as a foundational Arizona document utilized by the Commission to develop the original AUSF.

ATIC looks forward to your approval of the AUSF evolution at the March 14th meeting and subsequent steps to optimize the leverage it will bring to drive robust broadband connectivity to rural K-12 schools and libraries. We stand ready to assist with our technical and policy expertise, as well as act as a convener and facilitator of stakeholders as might be appropriate going forward. Thanks again for your leadership and efforts on this initiative. Well done!

Best Regards,
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Harnessing Global Information Resources for Informed Decision Making

UNIVERSAL SERVICE TO UNIVERSAL ACCESS

THE PARADIGM SHIFT IN CITIZENS' USE OF TELECOMMUNICATIONS

State of Arizona

Contract No. A6-0028-001

by

Mark Goldstein and

Richard Z. Gooding, Ph.D.

International Research Center
Tempe, Arizona

December 20, 1995

Universal Service to Universal Access

The Paradigm Shift in Citizens' Use of Telecommunications

by

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and

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State of Arizona Contract No. A6-0028-001

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Many thanks to **Don Henry**, Database Specialist and **Ruth Olsen**, Production Support for helping bring order from chaos. Also thanks to the many who participated; those who gave their time for interviews from the state Public Utility Commissions, the many public policy organizations who shared their views and resources for this study, and all those, both in and out of government, providing such a wealth of content on the Internet in a true public spirit of community, outreach and hopefulness.

And finally, much appreciation to the members of the Arizona Telecommunications and Information Council (ATIC) and John Kelly, the first to head the Arizona Governor's Office of Telecommunications Policy. May you lead Arizona with vision, foresight and determination through the shifting paradigms of the transition to the Information Age. (Rev. 1.1)

Universal Service to Universal Access

The Paradigm Shift in Citizens' Use of Telecommunications

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The Paradigm Shift in Citizens' Use of Telecommunications

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Every few hundred years, throughout Western history, a sharp transformation has occurred. In a matter of decades, society rearranges itself. Its world view, its basic values, its social and political structures, its arts and institutions. Fifty years later, a new world exists. Our age is such a period of transition.

Peter Drucker in the Harvard Business Review

STATE OF ARIZONA

GOVERNOR'S OFFICE
OF TELECOMMUNICATIONS POLICY

FIFE SYMINGTON
GOVERNOR

JOHN B. KELLY
EXECUTIVE DIRECTOR

PREFACE

When the Governor's Office of Telecommunications Policy was created, its organic mission included the development of strategies to ensure that the benefits associated with information technology would be broadly available to all of Arizona's citizens. The issues of Universal Service and Universal Access present extraordinary challenges to state policy makers. But the rewards of meeting those challenges will be rich indeed.

This study, performed with speed and professionalism by International Research Center of Tempe, Arizona, establishes an unprecedented foundation of data and thought on the topic of Universal Access. It assesses our past, our current day efforts, and then begins to explore the possibilities in our future.

The implications of policy decisions in this area are enormous. They will affect the future directions of education, health care, social services, and economic development. Our best hope lies in strategies that work within the constraints of a competitive marketplace with a minimum of distortions.

The opportunity for creative policy solutions is at hand. This superbly researched and prepared document will give Arizona's policy makers the tools they need to make informed and visionary decisions.

John B. Kelly
Executive Director

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Executive Summary:

> Our most successful experiments with universal access have been with telephony and broadcasting. And now more homes have TV sets than have indoor plumbing. And an extremely high percentage of homes have telephone services, even in poor and rural areas. To the extent that that service approaches universality, the value to every customer is enhanced. To the extent that digital services available over broader bandwidth connections become as crucial to the America of the next century as telephone service has been during this last half-century, the definition of Universal Service should expand. Just as with telephony, the higher the percentage of homes and businesses that can access and afford a connection to the so-called information superhighway, the more valuable that resource is to every home and every business.
>
> Al Gore, Vice President of the United States, in Forbes ASAP, December 4, 1995

Arizona is in the midst of vast change driven by advances in telecommunications technology. In the last decade, telecommunications and technology companies have provided new means of information delivery and human interaction, new types of investment and infrastructure, new reliance and expectations on the part of consumers and businesses alike. The next decade promises more of the same. The bandwidth of fiber optic cable, the flexibility of wireless signal delivery, the ubiquity of the personal computer as information appliance, the great global net of interconnectivity will drive the evolution of new applications, markets, governmental responsibilities and even social structures beyond what most may imagine.

As basic phone service became more common and access to it became increasingly important to modern life, the desire to make that access available to all lead to the development of Universal Service in telecommunications. For most of this century it has aided rural communities as well as low income and disabled individuals to enjoy the benefits of basic telephone connectivity with its ability to reach out to the world beyond. The definition of Universal Service has remained relatively stable until recently. The rapid pace and scope of developments in telecommunications are forcing a reevaluation as the marketplace moves towards deregulation, the number of competitors increase, and more advanced services are developed and deployed. Access to Information Age services and resources is becoming as important today as access to basic telephony was in earlier times. Thus, the concept of Universal Service must evolve in order to continue aiding those segments of the population with special needs.

Today, we struggle to operate under the legal framework of laws, regulation and court decisions that oversaw the telecommunications industry in a simpler and more stable era. Now increasingly outmoded for the more complex environment in which we find ourselves, some of the necessary changes become evident. With a multiplicity of market entrants and methods of telecommunications service delivery, the dismantling of some long standing government oversight and control is necessary to reduce the regulatory burden and let markets develop and flourish. However, there remain areas in which government must still protect the public interests, where the government must review and renew its delivery of services and finally, where the government must reengineer itself, utilizing modern models and tools, to meet these needs in a cost effective manner.

The purpose of this study, as mandated by the Arizona Legislature in 1995, is to inform and guide the Legislature and other public policy participants in developing Arizona's telecommunications policy by:

- Reviewing the historical context in which Universal Service developed
- Describing the current status of Federal and state government programs designed to implement and manage Universal Service
- Analyzing the potential significance and impact of pending Federal legislative and FCC initiatives
- Examining the issues states are debating now and key initiatives that have surfaced to redefine and expand the scope of traditional Universal Service

To determine the current state of Universal Service and the best thinking on its future, International Research Center interviewed Commissioners or senior staff members from the Public Utility Commissions of each state and the District of Columbia. These interviews provided a wealth of data on the current programs, pending changes and future thoughts of each states' regulatory scene. Individual state reports may be found in Appendix E, but the comparison and analysis of these interviews combined with state demographic data appears in the section Universal Service Around the Nation.

To augment this regulatory focused perspective, we reviewed a vast array of published literature, consisting of books, articles, position papers and industry analyses to glean current thinking and trends on Universal Service and related issues. In addition, many government agencies, industry trade associations, telecommunications providers, academic and public policy institutes were contacted to provide background, references, publications and their current thinking. We incorporated that material throughout this document and provide appendixes containing the bibliography and a telecommunications policy resource guide to aid further investigation in this rapidly evolving environment. In addition, we invited position statements from over a hundred organizations and enterprises, resulting in thirty submittals representing a wide variety of views and interests, available for your review in Appendix D.

An analysis is presented of the importance of telecommunications infrastructure and applications to regional economic development, the prosperity derived from developing and retaining high technology industry, and the rise of the virtual corporation. Then, to better enable the public policy reader to look beyond the horizon, we survey Data Points, Trends and Portents, showing the range of services and applications now available, their market penetration, likely competitive entrants, and what one might expect to see in the future. Hopefully, this will prove an aid in understanding the increasingly vital role advanced telecommunication services is coming to play in the life and livelihood of the average citizen.

The expected adoption of rules next year by the Arizona Corporation Commission should establish a formal and well structured Arizona Universal Service Fund that is designed to accommodate the entry of competitive providers into the local exchange market. Arizona will join some 16 other states with well established programs. Notably, some states have expanded the scope of Universal Service by utilizing excess revenues or fines imposed on carriers for service quality issues, to fund access to advanced services. Arizona should pursue its ability to act in a similar manner. Pending Federal legislative and Federal Communications Commission initiatives may soon play a significant role in tuning and redefining the traditional Universal Service concept, though it remains unlikely that they will sufficiently broaden its reach to incorporate a full range of advanced telecommunication and information applications.

The individual states can take the initiative in the transition of Universal Service to Universal Access by promoting the availability of public information, always essential to the fostering of democracy and development, as well as insuring access to such information and advanced telecommunications services to their rural communities and to their public institutions, and through those institutions to the citizenry at large. States can not provide or fund all the necessary advances and should look to public-private partnerships to help advance the deployment of services and the ubiquity of access desired. States can also foster market-sensitive approaches by policies that reduce regulatory barriers and by designing incentives to encourage service providers and market forces to bring new services to the broadest possible consumer base, retaining to as great an extent as possible equity in available services and costs across rural as well as urban areas.

Development and Institutionalizing of Universal Service:

Historical Context:

The term "Universal Service" was introduced in 1907 by Theodore Vail, then President of AT&T. However, in the early twentieth century it had quite a different meaning in practice. Due to basic incompatibility or a lack of interconnection, competing local phone companies could often not connect their respective customers to each other. "Dual service" or subscribing to both services with the attendant duplicate wiring and equipment was common, especially for businesses. Thus, Universal Service at first meant compatibility and interconnectivity of competing phone services that we today take for granted.
It was only later that the term "Universal Service" became associated with a social compact to connect those disadvantaged by geography, income or other factors.

The Mann-Elkins Act of 1910 gave regulatory jurisdiction for interstate telecommunications to the Interstate Commerce Commission (ICC), defining telephone companies as "common carriers" who were "to provide service on request at just and reasonable rates, without unjust discrimination or undue preference." The Communications Act of 1934, though not naming "Universal Service" specifically, lays out its basic tenets "so as to make available, so far as possible, to all people of the United States a rapid, efficient, nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges." Establishing the separate Federal Communications Commission, the act gave the commission new powers to regulate tariffs and services but expressly limited federal authority to interstate service. In 1994, the sixtieth anniversary of the Communications Act of 1934, President Bill Clinton said:

> When President Franklin D. Roosevelt signed this historic legislation so many years ago, few realized the dramatic changes in communications that the future would hold. Yet that stroke of the pen ushered in the beginnings of the Information Age, an era in which vast amounts of knowledge flow freely across continents and circle the globe in a matter of seconds.
>
> Today, as we celebrate the vision of the authors of the Communications Act, we are still defining the role that telecommunications technology will play in our society. With a universe of electronic information at our fingertips, we can better educate our people, promote democracy, save lives, and create jobs across America. As we work to enhance the partnership between the public and private sectors, we continue to draw inspiration from the original Communications Act, which has long served to benefit all of our citizens and to propel our nation into the future.
>
> (Federal Communications Law Journal, Vol. 47, No. 2, December, 1994)

There subsequently developed a series of programs, structures and protocols to encourage and enforce the expectation that basic local and long distance telephone service be available to all. The major components insuring ubiquitous availability of plain old telephone service (POTS) and other consumer services such as "free" broadcasting have been as follows:

Universal Service Fund (USF):

The Federal Communications Commission (FCC), anticipating the breakup of the Bell System, established the National Exchange Carrier Association (NECA) in 1983 as a membership association of local telephone companies. NECA is a non-profit company directly regulated by the FCC to establish and administer interstate access revenues, access charge pooling and administer the Universal Service Fund (USF) to provide assistance to telephone companies in high-cost areas (primarily rural, but defined as those with costs in excess of 115 percent of the national average). The funds are collected from major long distance carriers and administered and dispensed by NECA. The funds are used to extend telephone service to previously unserved areas, help pay for system extensions and to keep basic rates low.

Due to concerns about the Universal Service Fund's overall growth rate and annual growth fluctuations, the FCC adopted interim rules in December 1993 imposing an indexed cap on Fund payments for 1994 and 1995 pending completion of a broader proceeding on reforming the high cost area telephone assistance program. The USF expense adjustment for 1994 was projected as $741.5 million, however it was limited by a cap of $725.4 million. The USF expense adjustment for 1995 was projected as $777 million and capped at $749.2 million. The Arizona USF assistance for 1995 (capped) is $14.5 million.

NECA has had a policy of encouraging the investments of small telephone companies in new technologies. In their most recent study of telecommunications infrastructure (1993) covering 1194 small telephone companies, NECA tracked the deployment of fiber optics, digital switching and digital services. The study revealed that, despite their limited customer base and fairly broad service areas, NECA member companies continue a high rate of investment in modern central office switching, outside plant and signaling systems. Over 65 percent of these small telephone company customers had equal access to competitive long distance carriers up from 35 percent in 1991 (the FCC reports in February 1995 a 90% conversion for independent phone companies) and over 91 percent had access to digital switching.

> An evolving definition of Universal Service should be the foundation of a future national telecommunications policy. With technological advances making new services more affordable, subscribers are no longer content with "plain old telephone service." No community should be denied the opportunity to participate in and benefit from this exciting new network of the future.
>
> NECA 1993 Study - Building the Telecommunications Infrastructure of Rural America

Lifeline Assistance Programs - SLC Waivers and Link-Up America:

The Lifeline Assistance Programs are designed to aid low income residential subscribers. Again, funds are collected from long distance carriers and administered by NECA. Each state decides whether to participate and its public utility commission sets policies and guidelines governing the specific program implementation in that state.

As of April, 1989, the Subscriber Line Charge (SLC) for all residential subscribers to the public switched network rose from $1.00 to $3.50. To prevent subscribers from being forced off the network, the FCC established an SLC waiver program in 1985 where those customers meeting a state determined means test would have the full SLC charge waived if the state provided an equal reduction in either local service charges, connection charges or deposit requirements. NECA reports that in 1994, the SLC waiver fund was $123.4 million providing an average $2.34 per month in assistance to 4.4 million subscribers in the 35 participating states, the District of Columbia and the Virgin Islands. In Arizona, 9,146 subscribers benefited from $308,402 in SLC waiver subsidies last year.

The second program, 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). NECA reports that in 1994, the Link-Up America program fund of $18.6 million covered 839,470 subscribers in the 48 participating states, the District of Columbia, Puerto Rico, and the Virgin Islands. In Arizona, 367 subscribers benefited from $8,533 in Link-Up America subsidies last year.

Various studies have shown that these Lifeline Assistance programs have indeed had positive effects in getting subscribers onto the networks and in keeping them connected. States not participating in either program have shown lower level of total subscribership, especially for those households on public assistance.

U.S. Department of Agriculture Rural Telecommunications Financing:

Since 1949, the Rural Electrification Administration (REA) of the United States Department of Agriculture (USDA) has provided loans to small telephone companies serving rural areas to assure the availability of affordable, high quality service. Approximately 950 loans have been provided at interest rates below market, even below the cost of money to the government. This has led to over 96 percent of U.S. farms having telephone service and allowed the formation and survival of many small rural telephone companies as cooperatives. These coops would otherwise be unlikely to raise sufficient capital to initially build or modernize without access to such subsidized loans. If original qualified borrowers are acquired by larger telephone companies, these firms can continue to receive subsidized capital to modernize their rural areas.

Still, for the estimated 65 million Americans living in rural communities, problems remain with access to advanced telecommunications services. Most rural Americans still find online and Internet access prohibitively expensive since they must pay for a long-distance call to the nearest "point of presence." Further, while almost 80% of libraries in cities over 250,000 inhabitants have some Internet connectivity, only 17% of rural libraries do. The availability of high speed connections (i.e. - ISDN, frame relay, T-1, T-3) for rural institutions and businesses usually lags urban availability within a region, though some small LECs are upgrading faster than the BOCs.

The USDA's Rural Utilities Service (RUS) in FY 1994, used $12.2 million in funds to generate more than $500 million in Federal loans and loan guarantees, which in turn leveraged $2 billion in private investment in rural telecommunications infrastructure. In a typical year, RUS borrowers provide initial telecommunications services to over 62,000 families, install 6,000 miles of fiber optic cable, and purchase over 200 new digital switches. RUS also has a Distance Learning and Medical Link Grant Program which in FY 1994 made $10 million in grants to rural schools and health care providers to connect them to the National Information Infrastructure leveraged with an additional $15 million of private investments. They have proposed a new $100 million loan program for FY 1996 to further finance their goals of rural connectivity. The U.S. Department of Health and Human Services (HHS) also has a Rural Telemedicine Grant Program managed by their Office of Rural Health Policy. (Source: USDA RUS publications)

In addition, the USDA is developing a new Rural Business Telecommunications Partnership Loan Program to leverage government loans with rural investment capital to fund locally shared, end-user telecommunications facilities. The purpose of this program is to provide access to advanced telecommunications services and computer networks to improve rural job opportunities, stimulate local economies, and give rural businesses the opportunity to compete nationally and globally. An industry trade association, the National Rural Telecom Association (NRTA) has as its primary role the preservation of REA's role as the major provider of funds for rural telephone services.

Rate Averaging and Internal Cross-Subsidization:

State Public Utility Commissions require Local Exchange Carriers to charge the same rate for residences located throughout the often large geographic areas that each serves. This reallocates the actual costs to equalize or average rates across the LEC's service area independent of customer density and distance from switching offices, in effect subsidizing high-cost rural customers.

The Local Exchange Carriers are also closely regulated by the states as to approved tariffs, price caps and rate of return on their investments. LECs are allowed to charge fees above their cost for providing access to long distance carriers and the toll services charged to residential subscribers, with these revenues used to hold down the cost of basic residential service.

Assistive Technology for the Disabled:

Many Americans have physical disabilities which require special consideration in telecommunications as well as in other areas. With the growing percentage of older Americans, it's likely that the need for enhanced services and assistive technology will grow. In 1990, Congress passed the Americans with Disabilities Act (ADA) mandating the availability of interstate and intrastate telecommunications relay services to aid individuals with hearing and speech disabilities. In 1994, the Technology-Related Assistance Act was reauthorized. The United States has established the principles of a disability policy that stress inclusion, not exclusion; independence, not dependence; and empowerment, not paternalism.

The FCC adopted standards for Telecommunications Relay Service (TRS) providers, set forth a state certification program and appointed the National Exchange Carrier Association (NECA) to administer a fund. All common carriers contribute to the TRS fund on the basis of their interstate revenues. TRS providers then draw from the fund and include local telephone companies, long distance companies, state relay agencies and non-profit agencies operating state TRS programs. In operation, the individual with hearing or speech disability uses a text telephone (TTY) to call a toll-free TRS provider. A Communications Assistant (CA) then acts as speaking intermediary in placing the call to the intended destination and mediating the communication between the parties. States often oversee the availability and distribution of TTY terminals. Also, in most states, there are reduced telephone rates for handicapped subscribers and directory assistance charges are waived.

The FCC has long required that pay phones and emergency phones be compatible with hearing aids. Under a current proposal, most business telephones would be required to be hearing aid compatible by January 1, 2000 and existing business phone systems upgraded by 2005. Because this compatibility refers to the placement of an electromagnetic coil in telephone handsets, it is only effective with the estimated 1.8 million users of hearing aids containing a complementary electromagnetic coil (T-Coil). It does nothing for the balance of the 6 million hearing aid users (out of a total of 28 million Americans with hearing loss), but volume amplification controls and other technological solutions can offer some assistance.

The mandating of closed-captioning capability for most new television sets also aids the hearing impaired with the textual display of a programs audio content for an increasing proportion of the television programming delivered. A side benefit of such text displays can be the teaching or augmentation of reading skills to those not proficient in the English language.

Broadcast Radio and Television:

Broadcast radio followed by television has primarily been sent out to the public at no cost, being supported by advertisers (or in the case of public radio and television by government, public institutions, sponsors and listeners). Once one bought the receiving radio or television, the only residual cost was a modest amount of electrical power. Some of the same rural availability issues remain, but by and large, consumers have had free access to an enormous wealth (some would say dearth) of programming material. The advent of cable television altered the model, charging a basic fee for connection and programming as well as premium fees for extended services, however local broadcast options have remained free and available. Satellite broadcasting to consumers with dishes now down to 18 inches in size and sold for less than $600, helps solve rural access by equalizing access costs (though the entry barrier still remains too high for the economically disadvantaged). Though not part of the formal definition of Universal Service, and largely unidirectional in information and entertainment delivery, these broadcast mediums have set the stage for consumer expectations, broad media and visual literacy, and more advanced, interactive services to come.

Libraries as Public Repositories and Access Points:

> As we approach the 21st century, a momentous telecommunications revolution is taking place. Electronic technology can help you find a job in another state or read the Congressional Record online. It can connect a student to the local library or the Library of Congress.
>
> But what if that child's parents or school can't afford a computer? What if you don't have one in your home or don't know how to use one? The information superhighway promises vast riches of information, but it also threatens to widen the gulf between "information rich" and "information poor." Our forefathers and mothers knew it made good sense to invest in libraries as a shared community resource for books. It makes even more sense to support libraries in acquiring the powerful and expensive technology needed to obtain electronic information.
>
> Nothing is more important to the future of democracy than ensuring public access to information. That is why we need our nation's public, school, college and university libraries online. The technological revolution is happening **now**. And now is the time to support your library and all libraries in their efforts to ensure equity on the information superhighway.
>
> Betty J. Turock, President, 1995-96, American Library Association (ALA)

Public libraries have long supported the continuing education of the common man and the essential values of lifelong access to informational resources for education, business pursuits and literary entertainment. In recent years, libraries have increasingly automated access to their "card catalogs" allowing more accurate and versatile entry to their wealth of resources. In many cases, they have or will soon have public dial-in (and/or Internet) access to their card catalogs and other online resources, so one may explore a libraries holdings remotely before one visits. Trends in recent years have been to enhance publicly available collections with both audio and video material for loan, but also to have CD-ROM or other computer accessible information resources available to the visiting public at terminals and computer workstations or even by remote dial-in access. Hard copy serial collections are frequently reduced to pay for electronic versions of journals and magazines, but often a broader range of materials become available as the access becomes more precise and efficient. In the future, government entities will make increasing volumes of public information available but may or may not provide the means of access (i.e.- public kiosks), thus libraries seem the most logical venue to invest in and develop so as to support and expand public access to advanced information resources.

Pending Federal Legislative and FCC Initiatives:

> Tantalizingly close to toppling the cable/telco cross-ownership ban once and for all, Local Exchange Carriers wait for the courts, Congress and/or the FCC to cut them loose from legal limbo. The inevitable march at the federal level toward opening the video marketplace has competitors scrambling to ensure anti-competitive safeguards are in place. State and local governments also are sounding warnings that they have jurisdiction over intraLATA services and they don't intend to see their authority preempted.
>
> Deborah Ely, Washington Editor in America's Network, February 15, 1995

Is the 1995-96 legislative session the year that the Communications Act of 1934 is finally updated? Attempts last session faltered and no action was taken. The same may happen again. On June 15, 1995 the Senate approved telecommunications reform legislation, S. 652 by a vote of 81 - 18. On August 4, 1995 the House approved its version H.R. 1555 by a vote of 305 - 117 including the Manager's Amendment which substantially alters some of the original intent. A conference committee has been selected consisting of 11 senators and 9 representatives, though an additional 25 House members will participate in portions of the negotiations for a total of 45 conferees.

The outcome remains uncertain and this session is proving a busy one with the budget crisis, welfare reform, Bosnian peacekeeping efforts and other issues at the fore. Even if the conference committee produces a bill that both houses can and do pass, the president has threatened a veto over cable rate deregulation, media concentration, and the terms under which the RBOCs can enter the long distance market. The total federal legislative telecommunications reform effort is enormously complex with wide-ranging implications beyond the scope of this study. We will concentrate here on elements that concern the role and evolution of Universal Service.

Both the Senate and House versions direct a Federal-State Joint Board, comprised of three federal and four state representatives, to recommend a definition of and funding mechanisms for Universal Service to the FCC. The House version includes an additional state appointed utility consumer advocate representative. After enactment of legislation, the Board has 270 days to submit its recommendations and the FCC one year to complete any related proceedings. The House bill gives the Board a five-year life shifting oversight to the FCC, whereas the Senate envisions an ongoing role.

Both measures seek to promote "reasonably comparable services for the general public in urban and rural areas, while maintaining just and reasonable rates." The Senate version goes farther in asserting that "access to advanced telecommunications and information services should be provided in all regions of the Nation" and that "citizens in rural and high cost areas should have access to the benefits of advanced telecommunication and information services for health care, education, economic development, and other public purposes." In advancing those goals, the Senate version provides for special telecommunication access rates for rural health care facilities, most schools and libraries. While the House bill directs the Joint Board to recommend "specific and predictable mechanisms to provide adequate and sustainable support for Universal Service" and requires that all carriers make "equitable and nondiscriminatory contribution," the Senate version is more specific regarding contributions to and payments from a Universal Service fund. Senator John McCain of Arizona had offered a failed amendment that would have replaced the current system with a need-based voucher system, though the conference committee may revisit this proposal.

While both bills seek to address the difficult definition of future Universal Service capabilities, the Senate version is more forward looking and adaptive in requiring that the determination of included service elements be driven by "advances in telecommunications and information services" which "are essential for Americans to participate effectively in the economic, academic, medical, and democratic processes of the Nation." The Senate bill also allows the states to provide for additional conditions to advance Universal Service as long as these additions are paid for by the state and don't conflict with Federal rules. The Manager's Amendment to H.R. 1555 requires that the interest on escrow deposits received by the FCC for its spectrum auctions be used to establish a Telecommunications Development Fund. The fund would provide access to capital (as the REA does for rural telcos) for small businesses in order to enhance competition in the telecommunications industry. The Manager's Amendment further allows states to waive the rural telco exemption from interconnection/unbundling requirements and changes the standard of access by the disabled from "undue burden" to "readily achievable."

> I voted for this important legislation because it seeks to promote competition in practically all telecommunications markets. It also reduces the federal regulatory burden on communications firms. As a result of more competition and less regulation, American consumers will benefit from a greater choice of telecommunications services with lower prices and higher quality than is presently available. The legislation will allow local telephone companies to compete with cable companies to supply video services to homes across America. Once local telephone loops are open to competition, Bell operating companies would be allowed to compete in long distance and manufacturing markets. The bill also provides for the timely entry of Bell operating companies into electronic publishing and alarm services. Despite passage of both Senate and House measures by overwhelming margins,

controversy over selected provisions contained in the telecommunications reform measures insure that further modification of the legislation will be sought during the House/Senate conference.

John Shadegg, Congressional Representative, 4th District, Arizona

Pending FCC Initiatives:

The Federal Communications Commission (FCC) has also entered a process to review and revise Universal Service in response to some shortcoming in hoped for telephone subscribership rates and in anticipation of competitive local markets. On July 13, 1995 the FCC adopted two Notices of Proposed Rule Making (NPRM) and a Notice of Inquiry (NOI) regarding Universal Service. The comment and reply period for all three have now concluded, but subsequent action has not yet been taken. The FCC will eventually refer its proposals to the federal-state joint board on jurisdictional separations for a recommended decision.

Increase Telephone Subscribership:

Notice of Proposed Rule Making (NPRM) FCC 95-281 seeks to address the fact that while the average telephone subscribership rate is 94%, it is substantially lower for certain population groups, namely African-American, Hispanic and Native American households as well as those who are unemployed, receive public assistance or are "mobile" in their lifestyle. Many households without phone service were once connected but subsequently disconnected for failure to pay long distance charges. LECs could be prohibited from disconnecting local service for non-payment of interstate long distance charges (already prohibited in Arizona by Administrative Code section R14-2-509 subsection 1c) or required to offer interstate long distance blocking options or preset monthly limits on time or expenditures.

The NPRM also seeks to explore the feasibility of revising or expanding Link-Up America to better serve low income subscribers in connecting (or reconnecting) phone service and similarly adapting Lifeline Assistance with the aim of improving their retention as consistent subscribers. Significantly, the FCC also will review expanding Lifeline Assistance to cover multi-line public institutions, such as schools and libraries, taking into account their community role within the National Information Infrastructure.

Reconsidering the USF for High Cost Areas:

Notice of Proposed Rule Making (NPRM) FCC 95-282 and its attached Notice of Inquiry (NOI) exhibit the FCC's interest that the distribution of the Universal Service Fund (USF) be more equitable and efficient and its concern that the current implementation of the fund in providing assistance to Local Exchange Carriers in high cost areas may act as "de facto barriers to competitive entry." The FCC states four principles to consider in evaluating its proposals:

- Assistance should be properly targeted so that support is given only to those service providers or users who need assistance to maintain local service.
- To promote efficient investment and operation, assistance should be delivered on a basis that is technology-neutral in order to avoid encouraging investment in specific types of facilities or technologies when other means could deliver local service at lower cost.
- To avoid suppressing usage of interstate toll services, the provision of high-cost assistance should not impose excessive subsidy costs upon interstate carriers and ratepayers.
- Our high-cost assistance rules should not impose barriers to competitive entry into local telecommunications, nor otherwise disrupt normal market forces.

Currently, USF subsidies are provided to LECs based on their reported costs to provide phone service in high-cost, primarily rural, areas. The FCC is considering a "high-cost credit," essentially a voucher, for each individual subscriber line in high-cost areas, allowing customers to choose a LEC who would then receive

that credit. The high-cost credits may be limited to areas where local competition is established but issues as to determining the presence of competition and defining minimum service commitments remain.

The FCC is interested in more precisely targeting high-cost areas and may move from variable and usually large geographic areas to "Census Block Groups" of from 250 to 550 housing units as a basic geographic unit for which to calculate costs of service and subsidy levels. The current calculation are based on the LEC's reported costs of service but are being reconsidered. In the future, they may employ stricter guidelines in determining the LEC's costs or move to the use of proxy factors (such as subscriber density per square mile, average distance from nearest wire center, terrain, and climate) to calculate an objective high-cost basis independent of actual LEC costs. Yet a third option would be to apply such proxy factors to determine total support levels to be provided to each state, distribute the equivalent of block grants, and allow state Public Utility Commissions to design their own plans, in accordance with FCC guidelines, for distributing assistance to the LECs servicing high-cost areas.

The Dial Equipment Minute (DEM) weighting rules, allowing LECs with study areas of no more than 50,000 access lines to allocate a higher percentage of local switching costs to the interstate jurisdiction, may be revised or eliminated. And once competition for local telephone services is established, a system of competitive bidding by LECs to act as a "carrier of last resort" in specific Census Block Groups may be implemented. In an effort to control USF expenditures, assistance to any area that would total less than $1 per line per month may be eliminated. Also under consideration is an indexed cap for the total USF with adjustments in eligibility thresholds to keep within that level. And finally a proposal is included to means-test Universal Service assistance for the intended individual telephone subscribers.

All in all, an enormous range of Federal legislative and regulatory reconsideration of telecommunications issues is underway, which will affect the definition and manner in which Universal Service is provided for decades to come. Unfortunately, until the results of the Congressional conference committee are known and the proposed legislation is acted upon, matters are not likely to become much clearer. Even then, it will take a year for the new Federal-State Joint Board to make its recommendations and the FCC to complete related hearings. If telecommunications reform legislation passes this session, matters will become increasingly well defined and understood through calendar 1996.

> The ostensible goal of Universal Service is to make sure Americans of meager means can procure essential telecom services in high-cost areas at "just and reasonable rates." Fine and dandy. But does this require perverting the economic foundations of a $100 billion industry? Has anyone asked whether there is a more direct way to help the poor, such as means-tested vouchers that can be used to procure services on the open market? Food is more important than phone calls, but we sure don't ship food stamps directly to Stop-and-Shop and Grand Union based on some weird geo-political formula of hard-to-feed locations. Yet that's exactly what we do in the telecom business.
>
> Why is it that the regional Bells haven't adapted readily available technology to solve the problem of delivering basic services to high-cost areas? Could it have anything to do with the fact that all their costs get buried in the rate base, giving them a powerful economic incentive to remain inefficient? And just how is it a newcomer is supposed to compete if they can't outperform the incumbent in exactly those markets that are being uneconomically served? If telecom prices were allowed to reflect costs directly, undistorted by hidden taxes and subsidies, both the issues of cream skimming and red lining would go away.
>
> Bill Frezza, President of Wireless Computing Associates in Communications Week,11/27/95

Universal Service in the State of Arizona:

Over the last decade residential telephone subscribership in Arizona has caught up with national penetration averages. Between 1984 and 1993, the percentage of Arizona households with telephones rose from 86.9% to 93.4% (up 6.4%) while the national average rose from 91.4% to 94.2% (up 2.3%). In 1993, thirty four states exceeded Arizona's subscribership rate ranging up to a high of 97.3% (Pennsylvania). (Source : FCC Trend Report, February, 1995)

The Arizona Corporation Commission (ACC) is authorized by the state's constitution (Article XV) to "prescribe just and reasonable rates and charges to be made and collected, by public services corporations." Under its constitutional charter it is effectively another entire branch of state government with three popularly elected commissioners serving staggered, six-year, non-consecutive terms. Up until now, Arizona has not had as structured and rule-based a Universal Service fund as some states. A fund contributed to by LECs and toll service providers (but not by all connected to the public switched network) developed out of a Contel rate case in the late 1980's. They were acquired by GTE and subsequently, the service of the "study area" passed to Citizens Utility, who currently receives a rate subsidy of almost $750,000 a year. They are the only firm supported from the current state Universal Service fund.

The Arizona Corporation Commission (ACC) worked with industry and consumer groups to develop a more comprehensive Universal Service policy and this past summer moved to establish a new Arizona Universal Service Fund (AUSF). Its purpose is "primarily to assure the availability and affordability of basic local exchange telephone service in areas that are predominantly rural" and to broaden the base of telecommunications providers contributing in a competitively neutral manner. The proposed rules will be before the commission in the first quarter of 1996 with attendant public hearings. Section R14-2-1201 of the rules defines the required features of "basic local exchange telephone service":

- Access to one-party residential service with a voice grade line
- Access to touch-tone capabilities
- Access to an interexchange carrier
- Access to emergency services (including but not limited to emergency 911)
- Access to directory assistance service
- Access to operator service
- Access to a white page directory listing
- Access to telephone relay systems for the hearing impaired

The rules require that all telecommunications service providers that interconnect to the public switched network provide contributions to the AUSF. Providers of basic local exchange service (or equivalent service) will provide one-half of the AUSF funding based upon total access lines (including business, residence, wireless, public access and others) assessed as an access line surcharge. This incorporates all wireless providers (including cellular, paging and Commercial Mobile Radio Service) that interconnect to the public switched network as well as any non-traditional providers (such as cable television companies) that choose to offer basic local exchange telephone service. A second category consisting of providers of intrastate toll service will provide the other half of the AUSF funding assessed as a percentage of their total Arizona intrastate toll revenue. All other types of telecommunications service providers that interconnect to the public switched network after the rules take effect can select which category of service provider they will join, irrevocable for at least 3 years.

Any Local Exchange Carrier (LEC) may seek AUSF support in conjunction with a rate request. The amount of support will be based upon the difference between the benchmark rates for basic local exchange telephone service provided by the carrier and the appropriate cost to provide service as determined by the ACC, minus any Universal Service support from federal sources. For small LECs (20,000 of fewer AZ access lines), the

AUSF support area includes all exchanges they serve. For intermediate LECs (more than 20,000 but less than 200,000 AZ access lines), the AUSF support area will be either all exchanges they serve in Arizona or a differently defined support area as approved by the ACC. Any requests by intermediate LECs for AUSF support more than three years after the new rules become effective or by large LECs (more than 200,000 AZ access lines) any time after the rules become effective, will be based on U.S. Census Blocks (small geographic areas) and the Total Service Long Run Incremental Cost, based on incremental costs given that the requester is already providing other services and is further based on the least cost, most efficient technology capable of being implemented at the time.

Once the ACC approves AUSF support to a provider for a defined area, that support will also be available to competitive providers calculated on a per customer basis, at the same level at which the incumbent provider receives support. US West will serve as interim Administrator of the AUSF for a transition period pending appointment of a private, neutral third party no later than July 1, 1996. The ACC will review the implementation of the AUSF within three years to recommend any necessary changes.

The Federal Universal Service Fund (USF) assistance (or jurisdictional shift) from the National Exchange Carrier Association (NECA) for Arizona in 1995 (capped) is $14.5 million. Direct subsidies are provided to Local Exchange Carriers servicing high-cost areas, whose costs exceed 115% of the national average. NECA's 1995 disbursements are based on 1993 year end costs. The estimated 1996 figures are based on 1994 year end costs and still subject to modification by pending cap adjustments and USF rule alterations.

	1995 $	Est. 1996 $
Arizona Telephone Company	198,720.	224,712.
Citizens Utilities Company (DBA Citizens - Arizona)	0.	3,809,881.
Citizens Utilities Rural Company Inc.	3,035,350.	5,117,916.
Contel of California - Arizona	540,002.	1,133,970.
Contel of West Inc. (dba GTE of West AZ Inc.)	4,647,822.	0.
Fort Mohave Telecommunications Inc.	172,682.	347,506.
Gila River Telecommunications Inc.	751,386.	623,490.
Midvale Telephone Exchange Inc.	68,003.	118,368.
Navajo Communications Company Inc.	3,626,250.	2,804,696.
Southwestern Telephone Company	0.	18,776.
Tohono O'Odham Utility Authority	354,382.	322,946.
Universal Telephone Company of Southwest Arizona	100,978.	98,840.
US West Communications (formerly Mountain Bell - Arizona)	0.	0.
Valley Telephone Cooperative Inc.	970,338.	1,004,738.
Arizona Total NECA USF Subsidies	**14,465,913.**	**15,625,839.**

The FCC first certified Arizona for participation in Lifeline Assistance in 1986 followed by Link-Up America in 1988. In 1994, NECA provided $308,402 in SLC waiver subsidies matched by the state to 9,146 Arizona subscribers and $8,533 in Link-Up America subsidies to 367 Arizona subscribers. A Telecommunications Relay Service (TRS) has been in statewide operation since 1987 including toll-free access and funded by a surcharge on 911 revenue. Handicapped telephone subscribers are eligible for a 35% discount on direct dialed intraLATA toll calls and for the waiving of directory assistance charges. Since 1991, the Arizona Department of Economic Security (DES) has run the Telephone Assistance Program (TAP), subsidizing residential telephone subscriber costs for almost 7,000 households with low incomes and certifiable medical problems. It is funded by US West and serves only their customers.

Five Arizona telephone companies (Arizona Telephone Co., Citizens Utilities Rural Co., Gila River Telecommunications Inc., Tohono O'Odham Utility Authority, Valley Telephone Coop Inc.) currently participate in the USDA Rural Utilities Service (RUS) program for rural telecommunications loan support.

Universal Service Around the Nation:

In order to help policy makers better understand the current and future status of Universal Service in the United States, International Research Center conducted structured telephone interviews with a key informant in each of the 50 states and the District of Columbia, either senior level staff or Commissioners involved in telecommunication policy formulation in their state. Interview questions focused on:

- Status of Universal Service in the state and any pending actions
- Description of the states Universal Service program, if the state had one, including target groups
- Description of the Universal Service Funding mechanism, if the state had one
- State's participation in Federal programs that support Universal Service (Lifeline, Link-up America, High Cost)
- Definition of "basic service"
- Rates and types of technology used to provide "basic service"
- Public/private partnerships used to promote Universal Service/Universal Access
- State programs promoting access to advanced information services
- State programs to provide electronic access to public/government records and documents.

Information gathered from these interviews was supplemented with other secondary information for each state. This secondary information included demographic information about the state's population, geographic size, and median income; census data on poverty levels (percent on public assistance and percent below poverty); FCC data on the state's telephone system (number of LECs, penetration rate, technology), and data from a study on rural LECs conducted by the Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO). In addition, key informants in states which had or were actively involved in developing a Universal Service program forwarded copies of relevant legislation, commission orders, and staff proposals.

Information gathered through the interviews was combined with the secondary data to generate a profile for each state. These profiles are included in Appendix E. To ensure the accuracy of the state profiles, a draft profile was faxed to the key informant in the state for review and modification. Changes were made to 26 state profiles based on key informant comments. In a number of cases, the changes updated the secondary data with more current information. Information from the state profiles was then aggregated into a number of matrixes which are presented and discussed below.

What is "basic service"?

Consistent with the Federal definition, states have defined Universal Service as the availability of telephone service at reasonable rates to all citizens in the state. Basic service, on the other hand, has been defined by a limited number of states, and those definitions vary from state to state. Table 1 shows the states that have defined basic service and the elements included in their definitions. Asterisks (*) indicate states with definitions that are pending. Twenty-five states have a pending or approved definition of basic service at this time. Based on these definitions basic service in the United States typically consist of a single party (16) voice grade (18) touch tone (20) line with access to emergency services (23) , directory assistance (16), operator services (14), long distance services (17), and a white page listing (18). A number of states also include Telecommunication Relay Services (TRS) for the hearing impaired (8). These are the identical elements as in the Arizona Corporation Commission's proposed definition for basic service in Arizona.

Less common elements included in the definition of basic service are a modem capable line (6), privacy protection (6), and access to repair services (5). The most unique services included are a required usage element (Connecticut and Ohio), non-published service (New York), access to optional digital services (Alaska), ANI capability (Connecticut), access to custom calling features (Missouri and Oklahoma), toll

Table 1: State Definitions of Basic Telephone Service

State	Single party	Multi-party	Touch tone	Rotary	Voice grade line	Fax grade line	(911)	(411)	Operator services	White page listing	Long-distance access	Modem capable	Repair services	Privacy protect	Other
Alaska*	Yes		Yes		Yes		Yes	Yes			Yes		Yes		Access to optional digital services
Arizona*	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes				Telecomm relay services
California			Yes		Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Colorado	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	2400	Yes	Yes	
Connecticut	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes			Yes	ANI Capability; Usage element
Delaware				Yes			Yes	Yes	Yes	Yes					Switch/relay access
Florida			Yes		Yes		Yes	Yes	Yes		Yes				Flat rate residential
Georgia	Yes		Yes				Yes					9600			1+ dialing
Hawaii*	Yes		Yes		Yes		Yes	Yes	Yes	Yes					Access to relay services
Louisiana	Yes		Yes				Yes	Yes	Yes	Yes	Yes				Affordable line connection; Telephone relay service; Customer support
Massachusetts															Unlimited calling in local exchange calling area
Michigan										Yes					Dial tone
Missouri	Yes		Yes		Yes		Yes				Yes				Access to custom calling features
Nevada			Yes		Yes		Yes			Yes	Yes				Dial tone
New Jersey	Yes	Yes		Yes	Yes		Yes			Yes	Yes		Yes	Yes	
New York*			Yes		Yes		Yes	Yes	Yes	Yes	Yes			Yes	Exchange access; Statewide relay service; Non-published service; Direct inward dialing
North Carolina*	Yes		Yes		Yes										Flat rate local calling
Ohio*	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes	14400	Yes	Yes	Usage packet (400 minutes); Telecomm relay services
Oklahoma	Yes		Yes				Yes			Yes		Yes			Custom calling features available
Oregon	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes				Toll blocking; Relay services
Pennsylvania	Yes		Yes		Yes		Yes	Yes	Yes	Yes	Yes				Disability services; Access to incoming and outgoing calls
Tennessee			Yes		Yes		Yes			Yes					Access line; Telecomm relay services; Educational discounts
Vermont			Yes		Yes		Yes	Yes				Yes			Enhanced 911 services; Telecomm relay services
West Virginia*							Yes	Yes	Yes	Yes	Yes				Telephone number; Local call switching; Telecomm relay services
Wisconsin*	Yes		Yes			Yes	Yes	Yes	Yes	Yes	Yes	9600			Telecomm relay services; Toll blocking; Annual directory; Reasonably adequate calling area
Wyoming	Yes				Yes		Yes				Yes				Residential or business; Flat or measured rate
Total	**16**	**1**	**20**	**2**	**18**	**2**	**23**	**16**	**14**	**18**	**17**	**6**	**5**	**6**	**(* - Definition Pending) (Page 15)**

blocking capability (Oregon and Wisconsin), educational discounts (Tennessee), and an annual directory (Wisconsin). While 25 states and DC did not have a definition of basic service at this time, a number of states are developing them in conjunction with open dockets on local competition or Universal Service.

What does "basic service" cost?

Table 2 shows the residential telephone rates (R1- flat rate) for the BOC in each state, and the range of rates for the LECs in each state. Since this information was not available from a secondary source, we relied on the key informant in each state to provide this information. Specifically, the key informant was asked what the rate would be for "basic service". Given the complexity of rate structures in some states, the variations in telephone service across the states, and the fact that half of the states don't have a definition for basic service, the rate information should be viewed with caution. Perhaps as more states develop definitions of "basic service", it will be possible to develop a better overall picture of the price of basic service in the United States and what customers should expect to pay for basic service. In Table 2, states with definitions of basic service are identified by asterisks.

In spite of these qualifications, there are a number of interesting patterns within the data. First, in some states the BOC has a single statewide residential rate, while in others there are a range of rates depending generally on the subscribers geographic location and calling area. The lowest reported rate for a BOC was in DC. DC, however, does not have a definition of basic service, has only one LEC, and this is a special rate for low income households. Of the states with a definition of basic service, Wisconsin has the lowest BOC rate ($5.40 for measured service) and New York has the highest rate ($22.27). The average rate for "basic service" for states with a definition is $11.95. In four small states, there is only one LEC, typically the BOC (Delaware, DC, Hawaii, Rhode Island). The number of LECs in the remaining states range from 2 (Maryland) to 160 in Iowa. The range in residential rates for LECs in almost all states was greater than the range of rates for the BOC. Thus, there are some LECs in each state with lower rates for residential service than the BOC and some with higher rates. LECs with the lowest rates typically have very limited calling areas, while LECs with the higher rates are in high cost/rural areas. Again, looking at those states with a definition of basic service, the lowest LEC rate was in North Carolina ($2.56) and the highest was in West Virginia ($36.00). The average of the lowest LEC rate for states with a definition was $7.30 and the average of the highest rates was $18.00.

Table 2 also presents results from the OPASTCO study (last three columns) which provides insights into the costs of providing basic service in rural/high cost areas. In 1994, OPASTCO examined the consequences of changes in FCC regulations that would eliminate federal support mechanisms for small rural LECs (i.e., DEM weighting, 25% gross allocator, USF, and federal Lifeline and Link-up America programs). The first column in this section of Table 2 shows the local service revenues per subscriber per month for small rural LECs included in the OPASTCO study group. The average for the 424 LECs induced in the study group was $15.31. The second column shows OPASTCO's estimate of the average local service revenues per subscriber per month that would be required if federal supports were eliminated. The average for the study group was $28.75. This means that, on average, local service revenues would have to go up by 72.3%, if federal supports were eliminated. Required revenue increases vary widely from state to state with greatest estimated increases being in New Mexico (228.8%), Texas (176.1%), North Dakota (170.4%), Idaho (157.6%), and Nebraska (154.4%). OPASTCO also surveyed a random sample of the study group's subscribers to determine the impact the estimated rate increase might have on continued telephone service. Twenty percent of the subscribers said they would discontinue service if the rates were increased to the estimated level.

Arizona's average local service revenues per subscriber per month in the OPASTCO study group ($21.05) was above the overall average ($15.91), but the percent increase in revenues needed, 47.8%, was less than the national average. This still reflects an average estimated increase in local service revenues of $9.64 per

Table 2: State Residential Telephone Rates

	Bell Operating Co.		Local Exchange Carriers			OPASTCO Study		
State	BOC	Rates	Number of LECs	Lowest Rate	Highest Rate	Rev/ Customer	Rev w/o Subsidy	% Increase
Alabama	Bell South	$16.00-15.00	34			$18.94	$30.42	60.6%
Alaska*	na	na	23	$5.00	$30.00	$20.94	$34.73	65.9%
Arizona*	US West	$13.18	14	$4.50	$21.00	$21.05	$30.69	47.8%
Arkansas	SW Bell	$14.00	27	$5.00	$32.00	$16.71	$28.66	71.5%
California*	Pacific	$11.25	23	$11.25	$17.80	$20.64	$48.77	136.9%
Colorado*	US West	$17.82	36	$4.15	$30.00	$21.31	$36.10	69.4%
Connecticut*	NYNEX	$12.50	3	$8.00	$15.00	na	na	na
Delaware*	Bell Atlantic	$9.40	1	$9.40	$9.40	na	na	na
Dist. of Col.	Bell Atlantic	$3.00-14.60	1	$3.00	$14.60	na	na	na
Florida*	Bell South	$10.65	13	$6.00	$11.63	$16.77	$30.32	80.8%
Georgia*	Bell South	$14.33	36	$4.00	$18.00	$18.12	$32.09	77.1%
Hawaii*	na	na	1	$14.40	$14.40	na	na	na
Idaho	US West	$11.61	16	$9.40	$17.20	$14.51	$37.37	157.6%
Illinois	Ameritech	$11.20	56	$5.40	$28.00	na	na	na
Indiana	Ameritech	$13.50	43	$3.00	$25.00	$16.19	$24.75	52.9%
Iowa	US West	$11.05-13.05	160	$2.00	$24.78	$13.92	$24.40	75.3%
Kansas	SW Bell	$11.00	45	$3.50	$13.00	$13.55	$28.07	107.2%
Kentucky	Bell South	$18.00	20	$5.00	$18.00	na	na	na
Louisiana*	Bell South	$10.97-15.05	21	$9.00	$18.50	$21.95	$44.24	101.5%
Maine	NYNEX	$10.50-12.50	24	$4.75	$14.50	$11.09	$25.63	131.1%
Maryland	Bell Atlantic	$9.52-11.17	2			na	na	na
Massachusetts*	NYNEX	$16.85	5			na	na	na
Michigan*	Ameritech	$10.38	38	$3.76	$12.30	$11.31	$19.87	75.7%
Minnesota	US West	$14.10	103	$5.00	$30.00	$15.25	$23.02	51.0%
Mississippi	Bell South	$14.85- 19.00	20	$11.50	$18.00	$21.40	$39.36	83.9%
Missouri*	SW Bell	$7.55-12.50	42	$4.00	$16.00	$13.91	$26.02	87.1%
Montana	US West	$13.84	8	$7.10	$16.38	$13.39	$31.70	136.7%
Nebraska	US West	$14.90	42	$4.00	$15.00	$12.90	$32.83	154.5%
Nevada*	Nevada Bell	$10.00	13	$5.75	$16.00	$15.56	$30.86	98.3%
New Hampshire	NYNEX	$18.00	14	$6.00	$9.00	$11.20	$22.04	96.8%
New Jersey*	Bell Atlantic	$7.00-8.00	3	$5.30	$8.30	na	na	na
New Mexico	US West	$10.96-15.86	14	$10.96	$15.86	$16.26	$63.22	288.8%
New York*	NYNEX	$12.45-22.27	40	$3.84	$17.92	$16.33	$26.15	60.1%
North Carolina*	Bell South	$9.94 -13.94	20	$2.56	$18.26	$19.07	$23.94	25.5%
North Dakota	US West	$12.00	29			$14.22	$38.45	170.4%
Ohio*	Ameritech	$15.25	42	$2.70	$22.90	$18.31	$21.88	19.5%
Oklahoma*	SW Bell	$9.50-13.00	47	$5.00	$20.00	$13.94	$33.84	142.8%
Oregon*	US West	$12.80	33	$8.00	$16.00	$15.99	$29.31	83.3%
Pennsylvania*	Bell Atlantic	$8.20-12.95	38	$3.25	$17.73	$12.09	$24.96	106.5%
Rhode Island	NYNEX	$7.50-22.00	1	$7.50	$22.00	na	na	na
South Carolina	Bell South	$14.20-16.90	28	$3.00	$16.90	$18.37	$24.80	35.0%
South Dakota	US West	$12.00-15.20	31	$5.25	$15.75	$11.85	$28.20	138.0%
Tennessee*	Bell South	$7.50-12.15	18	$6.00	$13.00	$16.67	$22.83	37.0%
Texas	SW Bell	$8.15-11.05	58	$5.05	$19.00	$15.55	$42.94	176.1%
Utah	US West	$3.50 -7.98	14	$10.00	$12.00	$12.60	$29.13	131.2%
Vermont*	NYNEX	$12.75	9	$6.00	$16.00	$15.15	$28.68	89.3%
Virginia	Bell Atlantic	$8.51-14.82	21	$6.00	$16.35	$13.05	$25.94	98.8%
Washington	US West	$8.75-12.75	26	$7.00	$26.00	$13.10	$25.94	98.0%
West Virginia*	Bell Atlantic	$15.80	9	$22.00	$36.00	$25.56	$49.37	93.2%
Wisconsin*	Ameritech	$5.40	86	$2.90	$25.00	$13.49	$17.45	29.4%
Wyoming*	US West	$12.64-14.64	14	$5.75	$16.80	$16.05	$35.26	119.7%

(Note: * indicates states with a definition of basic service)

subscriber per month for customers served by Arizona's 13 rural LECs. Thirteen percent of those survey by OPASTCO in Arizona said they would disconnect service if rates went up by that amount. This would equate to 9,700 access lines in rural Arizona. The OPASTCO study findings are important since they highlight one of the biggest issues related to Universal Service; that is, how to provide affordable telecommunication services to rural areas which have significantly higher costs than urban areas. The study provides an indication of what the actual costs are to provide telephone service in high costs areas, and the possible consequences of federal and state governments not taking necessary steps to maintain Universal Service in the new competitive telecommunication market.

How is "basic service" delivered?

Table 3 shows the types of technology used to provide telephone service in each state. Again, asterisks indicate states with a definition of basic service. Each year the FCC aggregates data on the types of equipment LECs have deployed, as reported by the LECs. The FCC has considerable information about telephone equipment in each state, but much of it is beyond the scope of this project. One general indicator of the level of the technology used to provide basic service is the extent to which the local loop circuit is digital or analog. Using FCC data on the "total equipped local loop circuit", the percent digital was calculated for each state (see column 1). Overall, 39% of the local loop is digital, but there are wide variations between states. In five states the local loop circuit is all digital, and in 18 other states including Arizona the local loop is more than 95% digital. States with relatively low levels of digital circuits included California (9.61%), Louisiana (10.58%), Massachusetts (6.95%), Nevada (10.36%), New York (8.41%), and Rhode Island (9.57%).

The key informants were also questioned about the type of technology used to provide basic service both in the "last mile" and in the infrastructure. All informants indicated that they used both copper and fiber optic to deliver basic service. Twisted pair into the residence, with copper and fiber in the infrastructure was the primary reported technology. Three states also were installing Hybrid Fiber Optic cable and 17 were using some microwave. Key informants were also asked if there were any unique technologies used to provide service, especially to rural areas. Nine states reported using Basic Exchange Telephone Radio Service (BETRS) and three reported using fixed cellular to provide basic service to isolated areas of their state, and one mentioned satellites (Alaska).

In summary, basic telephone service, for those states that have defined it, typically is a single party voice grade touch tone line with access to emergency services, directory assistance, operator services, long distance services, and a white page listing. The rates for basic service for BOCs is around $12.00 per month, but can cost be as much as $22.27 per month or as little as $5.40, and LECs may have rates exceeding $30.00 per month. Basic service is typically provided using twisted pair copper wire into the house with a mixture of fiber and copper in the infrastructure, although some remote areas require wireless technologies.

What is the status of Universal Service programs in each state?

In order to make telephone service available and affordable to all citizens, federal programs have been put in place to support Universal Service in every state and a some states have developed their own Universal Service programs. The oldest state program was established in California in 1983. Given recent trends toward deregulation of telecommunications and the introduction of local competition, almost very state is now involved to some degree in examining or reexamining Universal Service. For states which have had a Universal Service program, like Arizona, this has lead to a comprehensive change in the program. States which have not had a Universal Service program have responded quite differently. Some are just beginning to examine the issue, wondering if they need a fund. Others are finishing up the rule making process, and will be soon establishing their state's first Universal Service program. This section of the report examines

Table 3: State Telecommunication Technologies for Providing Basic Service

State	Percent Local Loop Digital	Copper	Fiber Optic	Hybrid Fiber	Microwave	Other
Alabama	18. 59%	Yes	Yes			
Alaska*	na	Yes	Yes		Yes	Satellite, BETRS
Arizona*	98.47%	Yes	Yes		Yes	BETRS
Arkansas	99.41%	Yes	Yes			ISDN
California*	9.61%	Yes	Yes			
Colorado*	94.04%	Yes	Yes	Yes	Yes	ISDN on 70% of lines
Connecticut*	90.87%	Yes	Yes	Yes		
Delaware*	100.00%	Yes	Yes			ISDN
District of Columbia	100.00%	Yes	Yes			
Florida*	35.43%	Yes	Yes			95% Digital Switches
Georgia*	27.79%	Yes	Yes		Yes	
Hawaii*	73.23%	Yes	Yes		Yes	
Idaho	98.91%	Yes	Yes		Yes	95% Digital Switches
Illinois	95.26%	Yes	Yes			
Indiana	99.46%	Yes	Yes			
Iowa	92.32%	Yes	Yes			
Kansas	100.00%	Yes	Yes			
Kentucky	17.70%	Yes	Yes			
Louisiana*	10.58%	Yes	Yes			
Maine	14.21%	Yes	Yes		Yes	BETRS
Maryland	100.00%	Yes	Yes		Yes	
Massachusetts*	6.95%	Yes	Yes			
Michigan*	99.96%	Yes	Yes			
Minnesota	99.78%	Yes	Yes			
Mississippi	16.44%	Yes	Yes			
Missouri*	94.93%	Yes	Yes		Yes	Fixed cellular
Montana	76.27%	Yes	Yes		Yes	BETRS
Nebraska	72.15%	Yes	Yes		Yes	
Nevada*	10.36%	Yes	Yes	Yes		Fixed cellular, BETRS
New Hampshire	12.92%	Yes	Yes		Yes	
New Jersey*	99.98%	Yes	Yes			
New Mexico	99.02%	Yes	Yes		Yes	BETRS
New York*	8.41%	Yes	Yes			
North Carolina*	23.00%	Yes	Yes			
North Dakota	84.82%	Yes	Yes			
Ohio*	96.88%	Yes	Yes			ISDN
Oklahoma*	99.70%	Yes	Yes			
Oregon*	98.63%	Yes	Yes		Yes	BETRS
Pennsylvania*	99.20%	Yes	Yes			
Rhode Island	9.57%	Yes	Yes			
South Carolina	25.01%	Yes	Yes			
South Dakota	66.30%	Yes	Yes		Yes	
Tennessee*	19.96%	Yes	Yes			ISDN
Texas	99.00%	Yes	Yes			
Utah	98.03%	Yes	Yes			
Vermont*	14.27%	Yes	Yes			
Virginia	99.74%	Yes	Yes			
Washington	97.73%	Yes	Yes			ISDN, BETRS
West Virginia*	100.00%	Yes	Yes			
Wisconsin	96.22%	Yes	Yes		Yes	
Wyoming*	67.96%	Yes	Yes		Yes	Fixed cellular, BETRS
AVG./TOTAL	**39.02%**	**51**	**51**	**3**	**17**	

(Note: * indicates states with a definition of basic service)

state participation in federal programs, status of state Universal Service programs, and characteristics of established state Universal Service programs. Key informants in each state were also asked to identify activities related to the provision of advanced information services such as video/cable, Internet, etc. Since the key informants are not directly involved in the regulation of these advanced services, they generally provided very limited, second hand information. However, one important exception involved rate cases where the Commission used its regulatory authority over local telecommunication companies as a means for enhancing the development of advanced information services. In a number of states, the Commission had used rates case findings and excess earnings as a vehicle to require a carrier, usually the BOC, to provide resources to increase the capabilities and access to advanced information services. Listed below are the states and, in brief, the programs they developed:

- In Arkansas, overearnings are to be used to upgrade infrastructure for hospitals and schools.
- California PUC is seeking Federal authority to use US Funds to for advanced information applications.
- Colorado set up a telecommunication trust fund for distance learning which is funded by the BOC.
- The District of Columbia had the BOC install ISDN lines in all schools.
- Georgia is requiring Bell South to spend $500,000,000 over five years for infrastructure improvements including distance learning and telemedicine applications.
- Indiana has mandated that the BOC spend $130,000,000 on infrastructure development and a grant program for distance learning - $5,000,000 per year is for schools, libraries, and government agencies.
- Kansas is having Southwestern Bell provide interactive video to all schools in the state.
- Maine has mandated that NYNEX spend $14,000,000 per year on infrastructure upgrades and $4,000,000 per year is to go to education.
- Michigan is requiring Ameritech to use its excess earnings to link schools to the Internet.
- In Missouri, SW Bell will fund special projects including "Telecommunity Centers."
- Oklahoma is having SW Bell upgrade the infrastructure in schools and provide access to the Internet.
- Pennsylvania is having the BOC hook-up schools and hospitals to the Internet.
- South Dakota is requiring US West provide local call access to the Internet.
- Texas assessed providers $150,000,000 per year for advanced infrastructure and applications.
- Wisconsin required providers to install fiber optic connections to all secondary schools in the state.

Participation in Federal Universal Service Programs

The federal government has three programs states can voluntarily participate in to promote Universal Service in their state -- Lifeline, Link-up America, and High Cost (USF) programs. Lifeline and Link-up America are targeted towards low income groups, while the High Cost fund is targeted to LECs in rural areas. Since these programs are voluntary, all states do not participate in all programs. Table 4 shows states' participation in the federal programs and related demographic data. The key informants provided the information on participation, while the demographic information was from the U.S. Census. Thirty-nine states and DC participate in the Lifeline program, while 45 states and DC participate in Link-up America. Arizona participates in both programs. Three were reasons given by those not participating.

- The state does not have the authority to mandate participation in a voluntary federal program.
- The state can not provide matching funds required by the program and cannot require the LECs to provide matching funds (i.e., Lifeline).
- The state is prohibited from validating income information required by the program.

Thus, in the case of these programs, lack of participation has little to do with the need for subsidized rates or reduced hook-up charges for low income households, and more to do with general statutory barriers. Some states that do not participate in these programs now are considering changing the law to allow participation, especially in those states contemplating the creation of a state Universal Service Fund. They may require LECs to participate in federal programs as a prerequisite to participation in a state program.

Table 4: State Participation in Federal Programs

State	Percent on Public Assistance	Percent Below Poverty Level	Federal Lifeline Program	Federal Link-Up Program	Proportion Rural	Subscribers Per Sq Mile	Federal High Cost Program
Alabama	7.10%	17.10%	Yes	Yes	39.6%	13.6	Yes
Alaska	6.70%	10.00%	Yes	Yes	32.5%	0.3	Yes
Arizona	6.40%	15.10%	Yes	Yes	12.5%	2.6	Yes
Arkansas	6.80%	17.40%	Yes	Yes	46.5%	9.6	Yes
California	10.70%	15.80%			74.0%	5.8	Yes
Colorado	5.00%	10.60%	Yes	Yes	17.6%	1.4	Yes
Connecticut	6.00%	9.40%	Yes	Yes	20.9%	na	
Delaware	5.20%	7.60%			27.0%	na	
Dist. of Col.	13.30%	20.30%	Yes	Yes	0.0%	na	
Florida	6.80%	15.30%	Yes	Yes	52.0%	13	Yes
Georgia	8.50%	17.80%	Yes	Yes	36.8%	13.9	Yes
Hawaii	5.90%	11.00%	Yes	Yes	11.0%	na	
Idaho	3.20%	15.00%	Yes	Yes	12.6%	0.7	Yes
Illinois	7.90%	15.30%		Yes	15.4%	9.9	Yes
Indiana	5.00%	11.70%		Yes	35.1%	12.9	Yes
Iowa	5.00%	11.30%		Yes	39.4%	8.5	Yes
Kansas	4.60%	11.00%		Yes	30.9%	4.6	Yes
Kentucky	9.80%	19.70%		Yes	48.2%	15.7	
Louisiana	10.20%	24.20%	Yes		31.9%	10.7	Yes
Maine	7.60%	13.40%	Yes	Yes	55.4%	11	Yes
Maryland	6.00%	11.60%	Yes	Yes	18.7%	77.1	
Massachusetts	7.50%	10.00%	Yes	Yes	15.7%	91.6	Yes
Michigan	9.00%	13.50%	Yes	Yes	29.5%	11.7	Yes
Minnesota	5.70%	12.80%	Yes	Yes	30.1%	6.8	Yes
Mississippi	11.80%	24.50%	Yes	Yes	52.9%	8.2	Yes
Missouri	6.80%	15.60%	Yes	Yes	31.3%	9.0	Yes
Montana	5.40%	13.70%	Yes	Yes	47.5%	0.5	Yes
Nebraska	4.20%	10.30%		Yes	33.9%	2.3	Yes
Nevada	3.60%	14.40%	Yes	Yes	11.7%	0.5	Yes
New Hampshire	3.40%	8.60%		Yes	49.0%	30.9	Yes
New Jersey	6.10%	10.00%		Yes	10.6%	387.2	
New Mexico	8.00%	21.00%	Yes	Yes	27.0%	0.5	
New York	9.00%	15.30%	Yes	Yes	15.7%	21.8	Yes
North Carolina	7.20%	15.70%	Yes	Yes	49.6%	30.0	Yes
North Dakota	4.30%	11.90%	Yes	Yes	46.7%	1.4	Yes
Ohio	8.70%	12.40%	Yes	Yes	25.9%	17.8	Yes
Oklahoma	6.40%	18.40%	Yes	Yes	32.3%	4.6	Yes
Oregon	5.20%	11.30%	Yes	Yes	29.5%	2.9	Yes
Pennsylvania	6.90%	11.70%	Yes	Yes	31.1%	36.9	Yes
Rhode Island	8.00%	12.00%	Yes		14.0%	na	
South Carolina	6.70%	18.90%	Yes	Yes	45.4%	25.8	Yes
South Dakota	4.60%	14.80%	Yes	Yes	50.0%	1.4	Yes
Tennessee	8.60%	17.00%	Yes	Yes	39.1%	16.0	Yes
Texas	6.30%	17.80%			19.7%	2.4	Yes
Utah	3.80%	9.30%	Yes	Yes	13.0%	0.6	Yes
Vermont	7.20%	10.40%	Yes	Yes	67.8%	23.1	Yes
Virginia	4.80%	9.40%	Yes	Yes	70.6%	15.0	Yes
Washington	6.90%	11.00%	Yes	Yes	23.6%	11.6	Yes
West Virginia	9.70%	22.30%	Yes	Yes	63.9%	8.9	Yes
Wisconsin	6.90%	10.80%	Yes	Yes	34.3%	13.6	Yes
Wyoming	5.20%	10.30%	Yes	Yes	35.0%	0.2	Yes
U.S. TOTAL	**7.60%**	**14.5%**	**40**	**46**	**24.8%**	**4.4**	**42**

According to the key informants, 42 states, including Arizona, participate in the federal High Cost program (USF). The predominate reason for LECs not participating is the state is not a high cost state. This typically means the state is small with a predominately urban population and/or they have no LEC (often they only have one LEC) with costs above 115% of the national average. Thus, barriers to participation in this program have less to do with statutory constraints and more to do with the LECs need for support.

Status of State Universal Service Programs. Key informants were asked a series of questions about the current status of any state Universal Service programs, and any pending actions related to Universal Service. Based on this information, five categories were developed to characterize the status of different state efforts with regard to Universal Service. The categories, referred to as "Status" in Table 5, are:

1. **No statutes, regulations, or commission orders mandating Universal Service**. States in this category did not have a mandate for Universal Service at this time. However, this did not mean the state was not considering a state Universal Service program, or that it did not have a general statement to promote Universal Service. In fact, almost all states falling in this category were actively investigating Universal Service, and determining whether it should be mandated. In many cases these states were studying Universal Service as a part of, or as an off-shoot of, a docket on local competition. Nineteen states fell into this category.
2. **Mandated Universal Service in initial stages of rule making process**. States in this category had a statute or commission order mandating Universal Service, and they were in the early stages of the investigative process. Five states fell into this category.
3. **Mandated Universal Service actively involved in rule making process**. States in this category had a mandate for Universal Service and were actively involved in developing rules related to Universal Service, again often as a part of, or extension of, a docket on local competition. Many of these states had legislative mandates to develop proposed rules for Universal Service, and were given specific time frames for completion. This category included nine states.
4. **Mandated Universal Service rules with approved rules, fund not in place**. States in this category had essentially finished the rule making process, and were waiting for final legislative approval to set up a state Universal Service fund. Two states, Wisconsin and Wyoming, were in this category.
5. **Mandated Universal Service rules with approved rules, fund in place.** States in this category had a mandate, rules and an approved state Universal Service Fund in place. However, these are not newly established funds, but are typically existing funds established in the late 80's. So, while the 16 states in this category have a fund in place, all except one, are in some stage of revision or modification. Nevada is the only state in this category finished this rule making process, and they have yet to collect or distribute Universal Service Funds. These states would fall into categories 2, 3, or 4, if they had not previously established a state Universal Service Fund. And like states in those categories, the redesign of the existing programs has been triggered by deregulation and local competition.

Besides showing the status or each state's Universal Service program, the relevant statutes, regulations or commission orders are cited in Table 5. In addition, the status of local competition and the date is was permitted is presented. This information was gathered from the FCC's report on Common Carrier Competition and updated by seven key informants on their draft state profiles. A brief summary of pending actions related to Universal service is also presented. More detailed descriptions of pending actions are included in each state profile (Appendix E).

Description of State Universal Service programs.

Eighteen states have approved Universal Service programs in place. These states and descriptions of their programs are shown in Tables 6 and 7. With the exception of state penetration rates, the information was gathered through key informant interviews and examination of commission orders and regulations. Penetration rate data is from the FCC's 1993/4 Statistics of Communication Common Carriers. Like the federal programs, state Universal Service programs generally target two different groups -- LECs in high

Table 5: Status of State Universal Service Programs

State	Status	State Statute	Commission Order	LEC competition permitted	Pending Activities Related to Universal Service
Alabama	1			8/95	APSC has docket and workshop on US.
Alaska	2	4205.145	R-94-5	policy barrier	APUC has a rule making docket to adopt US. Statute allows for creation of USF for long distance service.
Arizona	5		Contel Rate case	7/95	ACC has draft rules to establish a new USF that is more structured and rule based
Arkansas	5	23-17-304		prohibited	Statute gives commission authority to continue or change the USF. The APSC hasn't held hearings.
California	5	Moore Univ. Act 1983	84-04-053 PU Code 871	7/95	The CPUC has a major rule making investigation and is looking at a complete revision of the US program.
Colorado	5	House Bill 1335		5/95	Colorado has a high cost fund in place, but is currently developing revised rules for new act.
Connecticut	5	Section 16247		7/94	The dominant LEC is proposing a creation of a high cost fund. The CPUC is reviewing the proposal.
Delaware	1			no regulatory barrier	Delaware has a general statement to promote universally available and affordable service but not a US program.
District of Columbia	3		Rate case #850	statutory barrier	The PSC is looking at US as part of a new rate case.
Florida	2	CHAP 364.025		6/95	The FPSC just completed evidentiary policy making proceedings on an interim US mechanism.
Georgia	3	Sen Bill 137		7/95	The GPSC is in process of developing rules for a USF.
Hawaii	3	Act 225 1995		6/95	The HPUC has opened a docket and issued draft rules on competition and Universal Service.
Idaho	5	62-610 1988		prohibited	The IPUC has nothing pending regarding US, but a task force is looking at Idaho's telecommunications law.
Illinois	5	13-801		1988	Staff is filing proposed rules for US. They expect to be done by April, 1996.
Indiana	5	8-1-2.6		no regulatory barrier	The IURC is in the middle of a workshop on local competition, and is reviewing the US program.
Iowa	1			5/95 (never prohibited)	They are looking at US as part of a docket on local competition.
Kansas	1			no statutory barrier	The KCC has an active docket examining US in Kansas.
Kentucky	1			policy barrier	The KPSC has a docket on local competition that includes US and a USF. They expect to finish in 1997.
Louisiana	3		V-20883-Sub Docket A	prohibited	The Commission has proposed regulations for local competition which includes a mandate for US.
Maine	2	Title 35A, PT7, CH71		no regulatory barrier	The MPCU is considering polices to establish local competition which may lead to consideration of US.
Maryland	1			1994	US may be a commission case in future due to local competition.
Massachusetts	1			1991	US is one part of a pending docket on local competition. The MPUC should have a decision in March, 1996.
Michigan	1			1991	The MPSC has nothing pending regarding US.
Minnesota	3	Chap 156, S.F. No 752		8/95	Legislature required Commission to develop rules for US. The statutory dealine is August, 1997.
Mississippi	5		77-3-35	policy barrier	The MPSC opened a docket for local competition which will include US. They will hold hearings in 1996.

(Table 5 Continues on Following Page)

Table 5: Status of State Universal Service Programs (Continued)

State	Status	State Statute	Commission Order	LEC competition permitted	Pending Activities Related to Universal Service
Missouri	1			prohibited	The MPSC has a docket on local competition which may bring up the issue of US.
Montana	1			not prohibited	A task force is looking at the issue of US. They may addresss this issue as part of local competition.
Nebraska	1			not prohibited	The NPSC has a docket on US, and are in the comment stage. They also have a docket on local competition.
Nevada	5		RO63-95	5/95	They just adopted new omnibus telecommunications regulations that includes a Universal Service Fund.
New Hampshire	2	SB-106		8/95	The NHPUC has a docket on local competition and they are currently doing background research.
New Jersey	1			under consideration	The NJBPU has nothing pending regarding US.
New Mexico	5	63-9A-6.1		1985	The NMCC will be opening up a docket on local competition which may involve US.
New York	3		94-C-0095	1992	DPS has a docket on local competition and one part of it involves US.
North Carolina	1			1995	The NCUC has a docket on local competition and US. Interim rules are due 12/31/96, final rules by 7/1/98.
North Dakota	1			no regulatory barrier	The NDPSC has minimal jurisdiction over telecommunications. Nothing is pending regarding US.
Ohio	3	ORC 497-202 1988		8/95	The PUCO has a docket on local competition with US being a key part. Staff is now developing comments.
Oklahoma	1			possible statutory barrier	The Commission has a docket on local competition and draft rules, and US is a part of that docket.
Oregon	5	759-1103	95-1103	1993	Oregon has completed Phase I of a docket on US. Phase II will create the funding mechanism.
Pennsylvania	3	House File 518	Docket No 1-940035	yes	The PPUC has a Universal Service docket, and they expect to have their policy in place by Summer 1996.
Rhode Island	1			yes	RIPUC has nothing pending regarding US. They do have a docket on local competition.
South Carolina	1			possible statutory barrier	The SCPSC is just forming a task force to look at local competition. The task force will address US issues.
South Dakota	2	49-31-4.1 1988		yes	SDPUC has nothing pending regarding US.
Tennessee	3	Sec 65-5-207		1995	The TPSC has established a proceeding on local competition and is developing rules for US.
Texas	5	1987		1995	TPUC is currently revising rules for its high cost fund.
Utah	5	54-86-11&12		1995	Utah is revising its US program and expects to be done by September 1996. They have an interim USF.
Vermont	5	Chap. 87		no regulatory barrier	VPSB has a US program in place and is developing a formula for distributing high costs funds.
Virginia	1			1995	VCC does not have a docket on US now, but will after they issue rules on local competition.
Washington	5		U-85-23	1994	WUTC is developing a position paper on US and a USF in response to a LEC's request.
West Virginia	1			no regulatory barrier	WV is considering US as part of a docket on local competition, and they have formed a task force to look at US.
Wisconsin	4	S196.218 1994	1-AC-155	yes	The PSC has submitted rules to the legislature for their US program. The program is to start January, 1996.
Wyoming	4	37-14-501		1995	The PSC has nearly finished its rule making process for US, and the Governor will sign the rules within 60 days of final adoption.

cost areas and low income/economically disadvantaged households. Sixteen of the eighteen states with programs, are targeted at LECs in high cost areas, and eight are targeted to low income/economically disadvantaged. Seven states have programs targeted at just high cost LECs and only one state (Connecticut) is targeted at just low income/economically disadvantaged. Colorado, Texas, and Wisconsin have programs for users with disabilities, while Vermont has targeted emergency services and Wisconsin has targeted homeless and advanced services to schools and health care organizations.

Programs that are targeted at high cost areas are not portable, while programs targeted at low income/ economically disadvantaged, or users with disabilities are portable. That is, for these later groups the subsidy goes with the individual; if the person moves to another carrier's exchange, the subsidy moves to the new carrier. Portability should not confused with whether the individual gets a voucher or credit on their bill or not, or whether the funds go to the LEC. It is possible to have a voucher or credit go to a customer in a high cost area, even though it isn't portable. One informant suggested the idea of including a credit or voucher in high cost areas, so the customers would realize the subsidy they were receiving, even though it wasn't portable. Another interviewee suggested their state's high cost program should be modified so that only those who needed a high cost subsidy would get it -- that wealthy individuals would

Table 6: Description of State Universal Service Programs

State	Status	Penetration Rate	Targeted Groups	Administration	Is subsidy portable?
Arizona	5	94.1%	Rural/high cost	BOC	No
Arkansas	5	90.0%	Rural/high cost	BOC	No
California	5	95.2%	Rural/high cost Low income/economically disadvantanged	Independent 3rd party	Yes, for low income
Colorado	5	95.7%	Rural/high cost	Commission	No
Connecticut	5	96.4%	Low income/economically disadvantanged	LECs (changing to 3rd party)	Yes
Idaho	5	94.8%	High cost (not stated but implicit)	Independent 3rd party	No
Illinois	5	93.5%	Low income/economically disadvantaged Rural/high cost	Non-profit organization; LEC Assoc.	Yes, for low income
Indiana	5	92.9%	Rural/high cost	BOC	No
Mississippi	5	88.7%	None	BOC	No
Nevada	5	92.8%	Rural/high cost	Independent 3rd party	No
New Mexico	5	88.6%	Low income/economically disadvantaged Rural/high cost	Commission established board	No
Oregon	5	96.2%	Rural/high cost Low income/economically disadvantaged	LEC Assoc. (OECA)	No
Texas	5	91.5%	Rural/high cost Low income/economically disadvantaged Users with disability	LEC Assoc. (TECA)	Yes, for low income and disabled
Utah	5	96.6%	Rural/high cost	Commission	No
Vermont	5	94.7%	Rural/high cost Low income/economically disadvantaged Emergency services (911)	LEC Assoc. (NECA)	Yes, for low income
Washington	5	95.7%	Rural/high cost	LEC Assoc. (WECA)	No
Wisconsin	4	97.0%	Rural/high cost Low income/economically disadvantaged Users with disability, Homeless Advanced services to schools & health care	Independent 3rd party	Yes, for low income and disabled
Wyoming	4	92.6%	Rural/high rate	Commission	No

not receive a subsidy just because they lived in a high cost area. Doing this, would in affect make the states high cost subsidy portable. State Universal Service Funds are typically administered by an independent third party (4) or a LEC Association (5). In four states the commission is currently responsible for administering the fund, and in four the BOC administers the fund. Table 7 shows the funding mechanisms for current state Universal Service Funds. In all states except Illinois and Mississippi, LECs, the BOC and the IXCs contribute to the fund. Only six states currently require providers of wireless telecommunication services to contribute to the fund, and in all cases these are providers of cellular service. The trend in pending programs, however, is to define contributors as broadly as possible. Many states are developing mechanisms that will require wireless companies and resellers to contribute. One of the barriers these states face is they do not currently regulate wireless communication, and resellers are often located out of state. Arizona is one of the states that have defined contributors very broadly in their proposed rules to include providers of cellular, paging and commercial mobile radio services. Cable companies will also become contributors in many states once they are providers of local service. As one interviewee stated, "Any company that benefits from the network should contribute to the Fund."

States with a Universal Service Fund tend to use some variation or combination of "total revenues", "total access lines", or "total minutes of use" as the basis for determining each carriers contribution to the fund. The carries contribution is typically based on their proportion of the total for the state (i.e., what proportion the carrier's total revenues are in comparison to the total revenues for all carriers in the state). There are no distinctions made between business or residential "revenues", "access lines" or "minutes of use". Perhaps the most unique program currently in place is Illinois' program were customers can make a voluntary contribution to a fund that is used to waive installation charges to low income subscribers.

Most state Universal Service Funds provide a rate subsidy to the carrier or the customer, and even when the subsidy is for the customer, it typically goes directly to the carrier to off-set a credit on the customers bill. The trend in pending programs is to continue providing subsidies to carriers. Few states currently provide direct infrastructure reimbursement to the carriers, and when they do it is on a case by case basis.
The criteria used to distribute funds is closely tied to the selected target group. Generally, programs that target rural/high cost groups distribute funds to carriers based on the carriers costs or rates being above the statewide average by some percentage. Many current programs modeled their program after the federal high cost program, providing subsidies to LECs whose unsupported NTS loop costs were greater than 115% of the statewide average. Others states based distributions on the LEC's rates being a certain percentage above the statewide (i.e., Idaho, Wyoming) or above a certain fixed amount established by the Commission (Oregon, Utah). Programs that target low income/economically disadvantaged or disabled, subsidized carriers based on the number of eligible subscribers who receive credits. Wisconsin's program
is unique in that distributes "high rate assistance" based on the median income in the service area (i.e., if the rate for basic service is greater than 2% of the median income for the service area subscribers receive a subsidy). Many pending programs have yet to determine the manner in which they will distribute funds. Fund distribution is perhaps the most complex, unresolved and difficult issue in pending programs. Even those with proposed rules have yet to specify exactly how funds will be distributed.

In summary, states' Universal Service programs are generally targeted to high cost areas, and this trend continues in pending programs that are developing in response to local competition. Only a few small, urban states are focusing primarily on low income households. The selected target group, in turn, typically determines the type of subsidy and its portability, with most high cost programs providing rate subsidies to carriers. While some states use direct infrastructure reimbursement, they do not rely on this for promoting Universal Service to rural areas. There is clearly trends to broaden the base of contributors to state funds to include all telecommunication carriers that benefit from the network and to better target areas by using Census tracts for identifying high-cost areas. The greatest variation in programs, and perhaps the toughest issue is how to distribute funds. Many states are still trying to resolve this issue.

Table 7: Description of State Universal Service Funding Mechanisms

State	Contributors	Basis for Contribution	Types of Subsidies	Who Draws From Fund
Arizona	LECs, BOC, IXCs	Surcharges per access line and per minute of use on intrastate toll	Rate subsidy	LECs who demonstrate high cost (one LEC now)
Arkansas	LECs, BOC, wireless, IXCs	% of retail billed minutes of use	Rate subsidy	LECs with intrastate NTS costs per loop > 115% of statewide weighted average
California	LECs, BOC, wireless, IXCs	% of billable revenues	Carrier rate subsidy; Subsidy to customer	LECs with high cost and eligible subscribers
Colorado	LECs, BOC, IXCs	Minutes of use and access charge per line	Rate subsidy	Costs above average investment for the traffic
Connecticut	LECs, BOC, IXCs	Total gross revenues as a percent of total state revenues	Rate subsidy with subsidy going to customer	LECs with eligible subscribers Subscriber receives credits for intra and interstate service
Idaho	LECs, BOC, IXCs	Surcharge on all local access lines and each intrastate toll minute	Bulk check to carrier	LECs with rate for 1-party single line in excess of 125% of weighted statewide avg.; or avg. charge per minute for NTS/ WTS in excess of statewide avg.
Illinois	Customer contributions, and IXCs	Customer voluntary, and LEC intrastate minutes of use for high cost program	Waiver of installation charge to customer; Sliding scale subsidy to carrier for costs above statewide average	LECs based on the number of eligible PA customers; Small LECs based on average costs per access line versus statewide average
Indiana	LECs, BOC, wireless, IXCs	Intrastate carrier common originating and terminating access minutes	Rate subsidy; Direct infrastructure reimbursement; waiver of hook-up charge.	LECs with intrastate NTS costs above the statewide average
Mississippi	BOC, LECs	Minutes of use	Rate subsidy; Direct infra-structure reimbursement	13 LECs with high-cost
Nevada	All telecommuni-cation providers	% of intrastate retail revenues	Rate subsidy; Direct infra-structure reimbursement	Small LECs with rate of return below commission set level
New Mexico	No one currently	Total revenues	Rate subsidy	No one is drawing from fund
Oregon	LECs, BOC, IXCs	% of gross revenues	Rate subsidy; Direct infra-structure reimbursement	LECs who show cost shift would cause residential rates to exceed $15.00
Texas	LECs, BOC, IXCs	Access minutes of use	Rate subsidy to carrier; Equipment reimbursement; Customer rate reduction	LECs with high cost who show cause or those with eligible customers
Utah	LECs, BOC, wireless, IXCs	1/2 cent/minute NTS traffic	Direct infrastructure reimbursement, Cost of service subsidy	LECs (not BOC) whose rates equal or exceed a target rate set by the UPSC
Vermont	LECs, BOC, wireless, resellers	2% surcharge on all bills including interstate, cellular, directory assistance, 2-way cable, PCN service	Rate subsidy; Direct infrastructure reimbursement	Reimbursement to providers of TRS service; Rate subsidy to eligible customers; Direct infrastructure reimbursement to carrier for 911 upgrades
Washington	LECs, BOC, IXCs	Carriers proportion of total access minutes	Rate subsidy to eligible carriers	LECs whose unsupported loop costs is 115% of statewide avg.
Wisconsin	All providers of telecomm services with rev > $200K	% of gross revenues	Rate subsidy, Direct infrastructure reimbursement; Equip-ment reimbursement	LECs for eligible subscribers (low income and disabled); High rate assistance based on median income in service area
Wyoming	LECs, BOC, IXCs, wireless	% of gross retail revenues	Rate subsidy to carrier with credit on bill	LECs with rates above 135% of statewide average

Economic Development and the Rise of the Virtual Corporation:

> Information technology is obliterating the distinction between small business and big business. Big businesses are becoming collections of small businesses, and small companies are partnering with one another, creating virtual corporations for a given period. Many industries that have been dominated by large corporations, like the automobile industry, are becoming networks of small suppliers linked through Information Technology (IT). In the past, one of the major barriers to entry for small business into fields dominated by large players was access to information. But large companies no longer have a monopoly on information regarding emerging technologies, consumers, capital markets, or even personnel. Today, small companies can rapidly form niche markets using all this specialized information.
>
> Robert Reich, U.S. Secretary of Labor

The advances in telecommunications technology, first facsimile (fax) transmission of business notes and documents with unprecedented immediacy, the prevalence of e-mail and file transfer, and more recently the evolution of mobile computing, videoconferencing and groupware applications have proved to be substantial enablers to the efficient operation, delivery of customer service and strategic outreach and interaction of today's businesses. Large enterprises utilize these telecommunications tools to drive efficient internal operations and manage the information flows in their global organization and customer base. Smaller firms can form collaborative partnerships and offer more competitive service delivery by also employing these tools, creating a business presence and quality of service well targeted to an era of outsourcing and the rise of entrepreneurial service enterprises .

ASPED (Arizona Strategic Planning for Economic Development), the forerunner of today's Governor's Strategic Partnership for Economic Development (GSPED), in their January, 1992 report "Creating a 21st Century Economy: Arizona's Strategic Plan for Economic Development," clearly stated the issue:

> Telecommunications and access to information have taken on increasing importance as the global economy becomes more tightly connected. Invariably, the most economically successful regions of the world also possess the most advanced information and communications infrastructure. During the 1980s, a virtual revolution in telecommunications occurred as a result of the fusing of computer and communications technology. The revolution was further fueled by the breakup of AT&T and the new competitive marketplace it created. For Arizona, information and communications infrastructure may be the key to opening up whole new economic development opportunities.

This vision of Arizona's economic development, nourished by its active participation in the revolution in telecommunications, is further advanced by the January, 1995 report of the Governor's Commission for the Study of the Telecommunications and Information Industry in Arizona. The report, prepared by Network Resources, Inc. is titled "Arizona Telecommunications: Leadership through Partnership for Competitive and Innovative Information Industry." Section 2 on Telecommunications and Economic Development in Arizona analyzes in detail the historical trends and research data confirming that the need for and use of advanced telecommunication and information services is inexorably linked to economic development and that the telecommunications industry itself is a major employer and generator of economic activity. It also confirms the linkage of the availability of advanced telecommunication and information services to the presence and demands of high technology companies and that such availability remains a substantial factor in their growth, the new formation of such companies within an area and the potential for high technology business relocation to an area. The importance of such high technology businesses to the state's economy is very significant and well documented in the Governor's Commission report and elsewhere.

Rural areas can reap enormous development benefits from the availability of advanced telecommunication services that are competitive with the region's urban services and costs. Rural economic development, at a disadvantage for many traditional factors, can greatly benefit from the integration of technology and automation in its existing businesses and be aided in the development and attraction of new businesses, often diversifying the business base of a community in the process. Returning again to the January, 1995 Governor's Commission Study, we find extensive and thoughtful analysis in Section 8.3 on Telecommunications and Rural Development in Arizona authored by Edwin B. Parker including this quote:

> Telecommunications offers the promise and potential to help rural businesses overcome problems of distance and lack of economies of scale. Many rural businesses, especially information-intensive businesses, can bridge wide distances to serve an enlarged customer base, including urban customers, through advanced telecommunications technology and services. This is why many catalog sales and other "telemarketing" businesses have grown in rural areas in the past decade and why many software developers and "lone eagle" entrepreneurs have moved to rural communities. As the U.S. and Arizona economies continue the global trend to more high technology and telecommunications-dependent businesses, rural locations with good telecommunications can be economically viable.

A recent study, "Impact of High Technology Industry on the Arizona Economy," begins by describing that "Among states and cities that actively recruit businesses to relocate, high technology firms are coveted. There is good reason for this. First and foremost, the high technology industry offers high quality jobs. In addition, high technology firms tend to be export oriented and make important contributions to the balance of trade." The report, published October, 1995, was authored by Dr. Alberta Charney and Dr. Julie Leones, both of the University of Arizona in Tucson. Upon its release, Governor Fife Symington of Arizona said, "This report tells us that this is the industry that is going to carry us into the 21st century." Some highlights of the data are presented below:

Direct contribution of high technology industry to Arizona's economy (1994)

- 95,099 jobs representing 4.8% of total state employment in the following industries:
  - electronic components and computers 49%
  - aircraft and missiles 20%
  - scientific instruments (including optics) 18%
  - computer software and services 8%
  - research services 3%
  - chemicals (including biotechnology products) 2%
- $4.360 billion in employee compensation
  - $45,800 compensation (including all benefits) per employee
  - Average pay is 75% higher than average Arizona pay per employee
- $5.369 billion in foreign exports, an estimated 63% of total Arizona exports
  - 7% of high technology sales in AZ, 59% to rest of U.S.,34% are foreign exports
- $6.626 billion in total expenditures on goods and services ($2.862 billion spent in AZ)
- $5.931 billion value added to Arizona's economy (6.8% of Gross State Product)
- $250 million paid in state taxes

Total contribution of high technology industry to Arizona's economy (1994)

- 180,261 jobs representing 9% of total state employment
- $6.498 billion in employee compensation
- 9.546 billion in total value added impacts (11% of Gross State Product)
- $609 million paid in state taxes

In April, 1994, the AZTEL 2000 study "Strategic Plan for Arizona's Information Infrastructure" was published as a collaborative effort of government, University and private enterprise participants led by the Arizona Department of Administration. The report "concludes that current and future telecommunications environments are central to the economic, social, and educational growth of the businesses and people of the State, and that the infrastructure needed to support Arizona's emerging future must be flexible, dynamic, and inclusive." In regards to business and economic development, it notes "As in other modern economies, the competitive survival of Arizona's business and work force depends on both the flow of information and the infrastructure that controls that information within the State. Critical services such as government, education, manufacturing, agriculture, financial services, transportation, wholesale and retail commerce, and utilities are all becoming increasingly dependent on telecommunications for cost effective administration."

While going on to propose a vision of a coordinated Arizona's telecommunications infrastructure which has yet to be realized, the driving factors the Aztel 2000 Task Force identified remain thoroughly relevant:

- Enhanced global competitive advantage for our business clusters.
- Rapid development of quality jobs.
- Environmental, family, and business benefits from telecommuting.
- Support of our telecommunications enterprises in the global marketplace.
- Readily available government services.
- Enhanced access to health care.
- Improved public safety and emergency care.
- Improved life-long education.
- Improved economic well-being.
- North American Free Trade Agreement (NAFTA) data link for expanded commerce.
- Improved government cost, efficiency, and effectiveness.
- A balance between information access and individual privacy.
- Timely, efficient, and cost-effective introduction to and use of appropriate emerging technologies.
- Affordable telecommunications services.

The Morrison Institute for Public Policy at Arizona State University in conjunction with the Arizona Telecommunications and Information Council (ATIC - formerly the Advanced Information and Communications Infrastructure Foundation) surveyed Arizona businesses in June, 1994 on the effects of telecommunications and information issues on their individual companies and Arizona business in general. The nearly 60 businesses surveyed were from all around the state and included some of Arizona's most prominent employers as well as small, medium, and large businesses in each of the 10 industry clusters of the Governor's Strategic Partnership for Economic Development (GSPED). More than 80% of these companies, divergent in their size, location and industry, ranked telecommunications and information services as "very important" to the future success of their businesses. The majority of the companies currently use local and wide area networks, electronic mail, and electronic commerce. They also found they faced a variety of barriers to using telecommunication and information services in technical areas (incompatibility of systems, concerns for data security, complexity of technology), business rationale (difficulty in identifying return on investment), and market forces (lack of provider choice, access in their locale, regulatory barriers). The results of the survey indicated six directions for public and private entities. They are listed below, followed by selected data from the survey on Arizona business' current and planned utilization of various telecommunications technologies.

- Expand the amount and types of information and services available online from local and state government agencies.
- Promote electronic commerce in general, and "electronic data interchange" in particular, through legislation and technical assistance.
- Expand existing network information centers (such as those at the state's three universities) to increase technical assistance, information on connections, and training available to business.
- Produce a telecommunication and information "report card" regularly that rates Arizona's environment for services from the users' point of view. Use the process to monitor regulatory initiatives and developments among providers, in addition to the issues faced by current and potential provides in changing or expanding services.
- Advocate for the expansion of telecommunications infrastructure in Arizona that will allow businesses, regardless of location, to take full advantage of telecommunications and information services.
- Promote actions that will lead to reduced costs in telecommunications and information services throughout Arizona.

Table 8: Arizona Businesses - Utilization of Network Technology

	Currently Using %	To Be Used In 3 Years %	No Response %
Local Area Network	93	5	2
Internal E-mail	86	10	3
Electronic Commerce	76	21	3
Wide Area Network (WAN)	66	12	22
Commercial Services E-mail	48	24	28
Metropolitan Area Network (MAN)	24	30	47
Frame Relay	17	33	50
Switched Multimegabit Data Services (SMDS)	12	31	57
Asynchronous Transfer Mode (ATM)	10	43	47
Synchronous Optical Network (SONET)	2	36	62

(Source: Morrison Institute for Public Policy at ASU Study, September, 1994)
(From a Business Perspective: Outlooks on Telecommunications and Information Services)

Table 9: Arizona Businesses - Utilization of Telecommunications Transmission Systems

	Currently Using %	To Be Used In 3 Years %	No Response %
Modem	95	0	5
Dedicated Phone Lines	88	2	10
Wireless or Personal Communication Devices	69	21	10
Cable Systems	67	9	24
Fiber Optic Lines/Networks	66	12	22
Satellite	40	3	57
Microwave Radio Relay Systems	34	14	52
ISDN	33	26	41

(Source: Morrison Institute for Public Policy at ASU Study, September, 1994)
(From a Business Perspective: Outlooks on Telecommunications and Information Services)

Data Points, Trends and Portents:

This multi-part section is structured to illustrate the range of services and applications currently available, what role they play in today's telecommunications market, what competition may soon enter these application arenas, and what technology advances may drive their evolution. It is hoped that these brief overviews will aid the reader in grasping the complexity of telecommunications services and applications.

> People rarely distinguish among data, information, knowledge and wisdom. But they are as different from each other and as interlocking as starch molecules, flour, bread, and the flavorful memory of a superb morning croissant.
>
> Lewis Branscomb, Harvard professor and former IBM Scientist

Deregulation of the Local Telephone Market:

> Opening local phone and cable industries to vigorous competition will have a great long-term positive impact on high tech. This is especially true for America's PC industry, a world leader whose ever-more powerful machines operate over the narrowband copper phone wires and unswitched TV cables of regulated monopolies. Competition in local loops will drive investment in broadband switching networks. Additionally, state public utility commissions should complement federal reform by setting ISDN rates at POTS prices so that ISDN can serve as a bridge between narrow and broadband lines. Exploding Internet use is driving demand for ISDN lines and getting them should become inexpensive, fast and easy.
>
> Michael C. Mailbach in Upside, December 1995

Independent of federal action, many states have moved to allow competition in the local loop and more will follow in an inexorable march towards ending monopolistic control of local telephone service (see Table 10). Some consumer groups have voiced strong opposition to pending Federal Legislation that would prevent state and federal regulators from using rate of return regulation to set prices for local telephone service. The International Communications Association warns that this and even the proposed price caps, could cost consumers as much as $14 billion a year by awarding most of the benefits of technological change to telephone companies until a transition to a competitive market is complete.

Table 10: State Regulatory Commission Treatment of Competition in Switched Local Service (as of September 1, 1995)

	Competition is Allowed, Rules are in Place	Competition is Allowed, Rules are Not Yet in Place	Allowing Competition Under Consideration	Allowing Competition Not Being Considered
Firms are actively competing	IL, MI, NY, WA			
Firms have been approved for operation	CT, MD, MA, NC	AZ, OH, TN, UT		
Firms have applied for certification	CA, GA, TX	AL, FL, IA, OR, WI	KS, NJ, PA	
No statutory or generic regulatory barrier		CO, HI, ID, MN, NH, NM, NV, RI, SD, VA, WY	IN, ME, NE, OK, SC, VT, WV	DE, MT, ND
Generic policy or order is barrier				AK, MS
Statutory barrier			DC, KY (1)	AR, LA, MO

(Source : FCC Common Carrier Competition report, Fall 1995)

(Note: (1) Kentucky Public Service Commission indicates they belong one category higher up on this table, having currently a regulatory barrier, not a statutory barrier to competition.)

The glut of advertising from telcos seeking long distance customers will accelerate as they and other market entrants move to active competition for local service customers. Public and private telephone company advertising is already showing strong gains up 17.5% for the first half of 1995 to $762 million while cellular radio and phone system advertising surged 50.3% for the first half of 1995 to $141.5 million. (Source : Competitive Media Reporting)

As Local Exchange Carriers (LECs) downsize staffing to prepare for local telephone loop competition, service problems have seemingly increased in areas such as delayed installations, missing repair commitments and billing problems. Of 27 states reporting LEC staff reductions, 24 indicated an increase in service quality complaints (see Table 11). An upcoming NARUC study plans to recommend benchmark service levels, though it will be up to the individual state Public Utility Commissions whether to adopt them and how to monitor and enforce them. The importance of service quality versus lowest cost to consumers has yet to be determined in the local telephone market, but the immediate connection for customers of cellular and other wireless loop solutions may yet prove an advantage over waiting for conventionally wired service.

Table 11: Local Exchange Carriers Under Investigation for Service Quality Problems

LECs Under Investigation for Questionable Service Quality	State Public Utility Commissions Involved
Ameritech	IL, OH
GTE	AK, HA, MO, NC
NYNEX	NH (Informal Investigation), NY, RI
US West	AZ, CO, ID, IO, MN, NE, OR, SD, UT, WA

(Source: Preliminary Survey Results - National Association of Regulatory Utility Commissioners,11/95)

The FCC assists consumers in resolving a wide variety of problems. The three most common types of complaints accounted for more than half of the estimated 21,000 received in 1994. These top three categories were: "800" calls where the initial "free call" turned into a billable call, operator service company practices and rates, and unauthorized switching of long distance service ("slamming"). The FCC is starting to compile a periodic Carrier Performance Scorecard to enhance consumer awareness of common telecommunications problems and the carriers most prone to them.

Computers and Telecommunications - More, Better, Faster, Cheaper:

Residential Telephone Subscribership Trends:

The FCC reports that in July, 1994 93.7% of U.S. households had telephones representing 92.4 million of the 98.6 million households. This was down slightly from a year earlier (94.2%) but up as a long term trend from November, 1983 rates of 91.4% penetration. The FCC also reports that in October 1993, the average for flat rate residential service was $18.82 monthly, including taxes and subscriber line charges. In most cities, consumers can subscribe to a service with a lower monthly charge than the cost of unlimited one party service. The average minimum monthly bill for such services was $11.27, including taxes and subscriber line charges. At the same time, the average business rate was a total of $42.57 monthly.

An interesting report published earlier this year by the Rutgers University Project on Information Policy was titled "Universal Service from the Bottom Up: A Profile of Telecommunications Access in Camden, NJ." The authors, Dr. Milton Mueller and Dr. Jorge Reina Schement, studied Camden with a telephone penetration level of 80.6%, well below the national average, but with racial and ethnic composition and income levels similar to other low-penetration U.S. inner cities. They explore and discredit six common myths of telephone penetration, at least for their particular study area and methodology:

- Myth #1 - That affordability of telephone service hinges on the price of local access, thus the price of basic monthly service rates should be the focus of Universal Service policy. Most marginal users are driven off the network by usage-related costs.
- Myth #2 - That Universal Service subsidies should be focused on the elderly. For age 65 and older, national penetration rate is 97%. Lowest rates are in younger age groups, especially minorities.
- Myth #3 - That maintaining Universal Service is primarily a problem for rural areas. Nationwide, penetration in rural areas is several percentage points higher than in central cities.
- Myth #4 - That low income and minority areas are threatened with "electronic redlining," in which they are systematically denied access to advanced features and services.
- Myth #5 - That telephone service is intrinsically more valuable than cable television service, because the interconnectivity function of telephone is more important than the entertainment function of cable TV.
- Myth #6 - That adoption and use of the telephone and other electronic media are insensitive to differences in race or gender.

Cable Television Enters the Competitive Arena:

Cable television originated in the late 1940s as a means to carry broadcast signals into mountainous areas where over-the-air reception was poor with a community antenna and coax cable redistribution of television signals. With increased channel capacity, over time, cable systems developed local programming and licensed additional content sources, expanding their markets through all urban and most rural areas. The National Cable Television Association (NCTA) reports that there are over 109 national and 37 regional cable networks as of April, 1995. These cable systems pass by 97% of television households capturing 63.4% (60.5 million) as basic cable households, carrying an average 40 channels of entertainment, information and community access programs.

Cable systems pay "franchise fees" to their local communities, typically 5% of revenue reaching $1.01 billion in 1993 (up from $51.2 million in 1980). The industry's Cable in the Classroom program provides over 65% of U.S. K-12 schools with free cable service and access to commercial free programming. Cable companies employ over 109,000 workers and have revenues of over $23 billion a year. Over the next five years, an estimated $24.9 billion will be spent upgrading the network with fiber optics (an estimated 69,000 miles installed to date), digital compression technology, bi-directional signal capabilities and a new generation of set-top boxes. This will allow eventual expansion of video services to interactive modes, movies on demand, voice communications and high-speed access to online services.

Indeed, existing cable systems, with their broadband capable last-mile coax passing 97% of American homes, are well staged with some strategic upgrades, to challenge the Local Exchange Carriers for basic telephone subscribership while continuing to deliver mainstay entertainment content. Cable companies will also expand into Personal Communications Services (PCS), like cellular phone service, utilizing their existing infrastructure to transmit signals from cell to cell. And they will utilize their high bandwidth capacity to enter the "private line" business market as alternative or Competitive Access Providers (CAPs). Cable modems will allow personal and business users high speed access to the Internet and online providers at multi-megabit per second speeds, hundreds of times faster than telephone modems.

But while cable expands its markets, its traditional delivery of television programming is under attack. Direct Broadcast Satellite (DBS) has emerged as a strong competitor to cable with small (18") dishes, up to 150 higher quality channels, coverage across the U.S., and ready availability at retail outlets. It is estimated that DBS will capture over 2 million subscribers by the end of this year and from 5 to 10 million by 2000. Meanwhile, local telephone companies, with new regulatory authorization, will move forward in their efforts to deliver "video dialtone" (VDT) over their infrastructure. This competition should act to constrain market prices as new strategic alliances engage the battle for the consumers video dollars.

Cellular and Other Terrestrial Wireless Expand Their Range and Services:

With a 45 percent annual growth rate, the number of U.S. cellular customers exceeded 28 million by the end of June, 1995, growing by more than 4 million users in the first half of 1995. About two out of every three new phone numbers are being assigned to cellular telephones. Average local monthly bills dropped to $52.45 per month from $58.65 a year earlier, and down 46% from 1987 when the average monthly bill was almost $100. The industry's revenue for the year through June, 1995 was $16.5 billion. In the first half of 1995, nearly 2000 new cell sites were added and a record $2.8 billion was invested for a cumulative total since 1983 of more than $21.7 billion. (Source : Cellular Telecommunications Industry Association)

At least 420 MHz of radio spectrum is being reallocated and auctioned by the FCC for Personal Communication Services (PCS) and related technologies. Compared to the 50 MHz of spectrum used by current cellular carriers (two per market), this represents the equivalent of 16 additional cellular services in each geographic market. Plus the transition from analog technology, still prevalent in most existing cellular networks, to digital with its associated compression and interference immunity, will multiply the carrying capacity of those networks. The Personal Communications Industry Association (PCIA) estimates that by 2000 there will be 14.8 million subscribers to broadband PCS services competing with traditional cellular, which is expected to have almost 50 million subscribers by then. In addition, PCS will serve an estimated 8.1 million subscribers with narrowband two-way services (i.e. - two-way and digital voice paging).

The Local Exchange Carriers will find increasing competition from these "wireless local loop" providers. A recent study by Economic and Management Consultants International projects 7 million customers will abandon traditional wired telephone service by 2002, for specially designed and priced PCS services where the mobile instrument uses a home-based cell for at-home use with automatic transfer to mobile facilities and rates when away from home. Additionally, such mobile instruments may transfer to satellite services when out of terrestrial cell site range and incorporate advanced features such as paging, voice messaging and even video conferencing.

Today 170 wireless cable operators serve 700,000 homes with Multipoint Distribution Systems (MDS) but modern wireless cable television technologies may more significantly encroach on traditional cable providers. New local multipoint distribution services (LMDS) can provide interactive video, data and voice services. Perhaps 16,000 subscribers will be served from one node serving a 6 mile radius cell. The downlink could contain 224 digital video channels and telephony with more limited uplink bandwidth available to subscribers.

Wireless is being increasingly deployed within enterprises and organizations to link Local Area Network nodes without network wiring installation and mobile business users rely more and more on wireless messaging and voice services as they roam their territory and the wider world. A very interesting proposal from Apple Computer, supported by the National Telecommunications and Information Administration (NTIA) is before the FCC. The petition requests that approximately 200 MHz of bandwidth be set aside for non-licensed low-power digital applications allowing for perhaps 20 million bit per second digital information rates at distances up to 6 miles. Digital spread spectrum technology would allow many simultaneous users to share this "citizens band" at no cost and without license, undoubtedly leading to enormous growth in wireless LANs, telemetry and other enterprise and personal applications.

Satellite Based Wireless Covers the Globe:

Satellite communications have long been the global linchpin for transport of high-capacity audio, multi-channel video, and volumes of digital data to remote locations. Home satellite reception developed to tap off the video programming flow for personal viewing until eventually portions were scrambled and licenses to receive and decrypt sold to consumers along with the necessary equipment. More recently,

geosynchronous earth orbit (GEO) satellite systems have come online specifically targeted to consumers. These Direct Broadcast Satellite (DBS) systems (or Digital Satellite Systems - DSS) employ small dishes (18"), low-cost ($600-800) receiving packages, and cable competitive rates to deliver up to 150 channels of basic and premium video programming with high quality images and audio. Federal law currently prohibits these providers from delivering programming available locally including network television, PBS and local stations unless the consumer is in an area not reached by over-the air or cable services. Thus, for now, most DBS customers retain a basic cable subscription or antenna for local broadcast reception.

Global radio communications devices for consumer use will soon be practical with the upcoming launch of the Motorola-lead consortium's Iridium and other similar systems. Iridium will soon place 66 (and competitor Globalstar 56) low earth orbit (LEO) satellites in polar orbits insuring world-wide coverage. The new mobile telephones, as discussed above, will defer to the least expensive available connection, progressing from home-based cell to terrestrial cell to satellite as necessary. At long last, there will be a system deployable in rural areas at equivalent costs of infrastructure, equipment and (to a varying degree) usage. To the extent that these satellite systems succeed in the market and costs of ownership and use are driven down, long standing rural high-cost infrastructure and service delivery issues will at last fade. More ambitious visions, such as Teledesic (backed by Bill Gates and Craig McCaw), plan for 840 satellites linked to a fixed grid of 20,000 supercells across the earth's surface enabling higher bandwidth applications from fixed and mobile customers on a global scale.

Interesting hybrid options will occur, such as Hughes' DirecPC, which via a small satellite reception dish will allow subscribers to receive a personalized stream of digital data, such as Internet downlink at 400 Kbps while simultaneously uplinking low-bandwidth navigation commands through telephone lines and their Internet access provider. Additionally, the continuing evolution of Global Positioning System (GPS) applications combined with terrestrial transmitted weather and traffic data will drive vehicular navigation and other mobile applications.

Fiber Deployment - Telecommunications at the Speed of Light:

The first commercial fiber-optic cable was introduced by Corning Glass in 1970. By 1980, 3,700 miles were deployed and exponential growth has occurred ever since. Fiber's ability to carry very high bandwidth combined with its low bulk compared to copper trunk cable has made it the transport medium of choice for telephone, cable, and utility companies alike. Fiber deployment moves ever closer to the home as telecommunications providers design their networks to deliver higher bandwidth applications to consumers, but usually stops short of actually reaching those homes, merging with existing twisted pair or coaxial infrastructure at some distance away. Large business users often receive their long distance telephone connection from their Competitive Access Providers via fiber from metropolitan loops directly into their facilities. Within business enterprises, fiber optics are being more frequently employed as Local Area Network back often to the department level and even to the desktop, especially where high-end computer workstations are used.

Public utilities often install fiber cable along their right-of-ways, driven to abandon traditional microwave connections to remote facilities by FCC reallocation of radio spectrum. Where not prohibited by their regulatory oversight agencies, they may become resellers of fiber capacity or "dark fiber." Cities and states may also benefit from leasing right-of-way access either by fees or in exchange for municipal or government use of the commercial fiber infrastructure. For example, New York State recently granted a 20 year agreement for a fiber optic network to be distributed along the Thruway to be remarketed to other communications carriers. It is expected to stimulate economic development along its path and yield 20% of the network's gross revenues in payment to the state.

From POTS to ISDN to ATM:

Plain Old Telephone Service (POTS) has been the mainstay of personal and business voice communications for well over a century. It has evolved to support many new features and functions: touch-tone dialing, 911 emergency service, facsimile (fax) document transmission, computer data transmission via modem (from an original 55 baud to 28.8 K baud today), caller identification, call waiting/forwarding, voice mail, automatic credit card authorizations and remote applications from keypad entry. The mostly analog telephone instruments and signals have connected to an increasingly digital and complex infrastructure.

Integrated Services Digital Network (ISDN) moves the essential digital conversion of voice, allowing the integration of additional data forms, back to the subscriber's instrument. In doing so, it completes the digitization of the telephone network enabling existing copper wire infrastructure to support higher information rates, transport that information in its most efficient, digital form and makes possible a host of new services and applications as well. The RBOCs have been upgrading their Central Office equipment aggressively and ISDN is now available in from 70 to 100% of their territories. An estimated 650,000 lines will be in use by the end of 1995, and many millions more in the next few years. Pacific Bell estimates that they will deploy over a million ISDN lines in California alone by the year 2000.

Still problems abound. Special new customer premises equipment is necessary at substantial cost, though those costs are dropping. Specifications for installation and configuration are complex and often troublesome to get working properly. The providers themselves are often not yet familiar enough with the technology to provide adequate support. None the less, the transition from POTS to ISDN will persist. With ISDN, Internet access can be accelerated by a factor of four as effective baud rates reach 128K. Collaborative computing and telecommuting are further enabled as voice and data can be mixed so that documents and videoconferencing transmit simultaneously with conversation. It should serve well the Small Office or Home Office (SOHO) and Work-at-Home environments, becoming ever more prevalent.

Table 12: ISDN Rates for Business

Regional Telephone Network	Installation Cost	Monthly Rates	Per Minute Rate
Ameritech	$144	$38	$.04 first, .04 +
Bell Atlantic	$98	$19.26	$.09
Bell South	$264	$111.50	surcharge
GTE	$110	$50	surcharge
Nevada Bell	$227	$80	flat rate
NYNEX	$117	$46	$.06 ($.01-$.55)
Pacific Bell	$40	$26.5	variable
SNET	$245	$33	$.03
Southwestern Bell	$485	$31	flat rate
US West	$110	$69	$.10

(Source: Dataquest, Inc., Note: Residential Rates may be lower and all rates may vary by area)

For all its improvements in digitizing basic phone service at its source and all its promise, ISDN is still the first step for the telcos on the path to deliver broadband to the home. Network transport protocols such as Asynchronous Transfer Mode (ATM) must be overlaid on digital signal communications to allow bandwidth on demand and varying priorities to be assigned to different digital message packet streams. Twisted pair capacity will not be bound by current ISDN rates, but as research and development efforts bear fruit, move into the multi-megabit ranges to allow competition with other providers for the advanced services market as it continues to develop.

Personal Computer Ownership and Modem Use:

The rise of computer sales for home use should not come as any surprise. Most parents would like their personal computer to remain personal, which means that (for those who can afford it) a second home computer has become a necessity. Frequently, the kids' computer is better than the one the parents control, loaded with "educational" features. I hear a constant stream of stories from proud parents whose son or daughter has mastered the mechanics of their machine.

Glorianna Davenport, MIT Media Lab in IEEE Multimedia Fall, 1995

Table 13: Trends in PC and Modem Ownership and Use

	1994 %	1995 %
Household has a PC	31	36
Ever use home PC	26	32
Use home PC daily	6	7
Use home PC for Personal Use	21	29
Use home PC for Work	17	18
Use home PC for School	12	12
Use a PC at Work	NA	41
Use a PC at Home	NA	10
Home PC has a Modem	12	20
Someone in House goes Online from Home	8	11
Percent of Americans who go Online from Home	6.6	8
Subscribe to Commercial Online Service	3	6
Use Internet Directly	NA	1
Connect to Office or School from Home	3.6	3

(Source: Times Mirror Center for the People & The Press, Technology in the American Household 10/16/95)

Table 14: Percentage of Households with a Personal Computer by Income and Education

Family Income	High School or Less	Some College	College Graduate
Under $30,000	14	32	43
$30,000 to $49,000	29	47	55
Over $50,000	50	62	73

(Source: Times Mirror Center for the People & The Press, Technology in the American Household 10/16/95)
(Note: Average 1995 Percentage of U.S. Households with PCs = 36%)

Table 15: Percentage of Households Who Go Online by Income and Education

(% of Population in Category / % of Computer Owners in Category)

Family Income	High School or Less	Some College	College Graduate
Under $30,000	4 / 29	15 / 47	24 / 56
$30,000 to $49,000	8 / 28	17 / 36	26 / 47
Over $50,000	17 / 34	26 / 42	35 / 48

(Source: Times Mirror Center for the People & The Press, Technology in the American Household 10/16/95)
(Note: Average 1995 Percentage of U.S. Households Who Go Online = 11%)

In the Times Mirror Center study, of the 36% of American households with PCs, 21% have had them for more than two years, 11% for less than two years, and 4% though they own a PC, don't use it. An additional 9% had a PC at one time but gave it up. The Arizona Republic and Phoenix Gazette recently commissioned a study that showed Phoenix area computer ownership of 51%, well above the 33-36% of most national polls. It also showed that 22% of the total local population goes online versus much lower national numbers. They consider the margin of error to be 4% and no specific explanation of the higher Phoenix computer and online usage is readily available without detailed analysis of the study's methodology and sample group. Other interesting data on consumer attitudes regarding local telephone and high tech services competition is also presented.

Table 16: The Arizona Poll on Telecommunications

	Yes	No	Don't Know
Do you have a computer at home?	51	49	-
Do you use the Internet or other online services such as America Online or Prodigy at home? (Note: % of 73% of computer owners with modems)	59	41	-
Do you think competition between local telephone service providers will help hold down costs to the consumer?	64	18	18
Do you think competition between local telephone service providers will speed up introduction of new high-tech advances, such as videophone service and movies on demand?	68	15	17
Would you consider using your cable-TV provider to provide telephone service?	32	42	26
Would you consider using your cable-TV provider to provide a package of services like telephone, cable TV and computer data transmission?	37	40	23

(Survey conducted for The Arizona Republic and The Phoenix Gazette, 9/22-23/95, 600 Adults)

Gordon Moore, founder of Intel, proposed more than twenty years ago that semiconductor fabrication density of transistors in integrated circuits would improve rapidly and continuously leading to a doubling of memory chip capacity about every 18 months and a doubling of effective microprocessor speed every two years. Moore's Law, as it has come to be known, suggests that the microprocessors of today at some 4 million transistors will utilize 13 million by 2001 and 90 million by 2010 in ever denser, more efficient chips. Speed, processing capability and memory size driven by ever more demanding applications tends to obsolete our business and personal computers every other year or so. The trends in increasing computer power and capacity available at reasonable cost, access to higher bandwidth through public and private networks, and implementation of better signal compression technology will converge to drive incredible advances in multimedia enabled applications incorporating virtual reality elements.

Though the demand for portable computers has soared, Personal Digital Assistants (PDAs), handheld computers, have languished. PDAs will be reenergized by PCS and other emergent wireless connectivity and may well combine with mobile telephony into a single portable computer-phone instrument. On the low end, there is much talk of new, inexpensive ($500 price point) "Information Appliances." These limited functionality computers could be used in connection with the networked information infrastructure (client-server model) to serve most individual's needs (or so the story goes). How they will fare in the market and how a new generation of cable set-top boxes will position against personal computers for control of the media hearth in the home is yet to play out. Stay tuned!

Advanced Telecommunication Applications:

If knowledge is power, then control of the kingdom of information could be at your fingertips within a decade. Flick a switch, and a video window covering a wall in your home will open up your ramp onto an ultra highspeed data highway shipping electronic bits of information at light speed. Booting up your computer, you'll cruise along hair-thin fiber optic grids. At a command, specially designed knowledge robots, your information slaves, will rocket through the supernetworks, sifting databases larger than the Library of Congress to ferret out whatever you request. The network's capability to transmit lifelike video images can electronically transport you on virtual voyages to the far reaches of the data galaxy or bring the world to your living room.

Corporations, research labs, universities and medical centers will interface through a national data highway transmitting visual and audio images thousands of times faster than today's fastest networks. These synergistic links between myriad scientists, scholars, government officials and business people should catalyze an information explosion profoundly transforming the way we live. Such a supernet could allow anyone on the data highway to harness up the power of supercomputers and provide users with calculations for complex applications such as climate modeling, stock market analysis, cosmological research and medical diagnoses and treatment.

Omni Magazine, December 1992

Table 17: Estimates of New Media Technology Markets in $Million

	1994	1995	1996	1997	1998
Commercial Online Services (1)	795	1,100	1,600	1,800	1,700
Internet (2)	366	771	1,500	2,400	3,700
CD-ROMs (3)	2,500	2,800	3,100	3,300	3,500
Kiosks (4)	292	496	823	1,400	2,200
Interactive TV (5)	37	261	831	2,000	4,200
Infomercials/Home Shopping (6)	2,800	3,300	3,900	4,600	5,400
Videogames(Hardware/Software) (7)	3,800	3,900	4,000	4,200	4,300
Virtual Reality (6)	116	190	262	374	570
Total New Media Markets	**10,706**	**12,818**	**16,016**	**20,074**	**25,570**

(Sources: (1)Forrester Research, (2) Goldman, Sachs & Co., (3) Dataquest, (4) Inteco Corp., (5) Jupiter Communications, (6)Paul Kagan & Assoc., (7) BT Securities)

Customers no longer will take merely what we give them. Customers will become powerful buyers, not just users, driving the direction of the market, not necessarily regulators or product developers. Consumer receptiveness to choice is what drives technology. Technology does not drive consumer receptiveness or choice.

There is no threat to market diversity when thousands of content providers, network access providers, manufacturers, telcos, cable companies and all the other companies are already out in the field lining up for the transition. Do not be obsessed with dividing the pie. It's making it bigger that is better for everyone. We will spend more than $20 billion in the next ten years updating our networks for tele-TV, Internet access, video phones and similar products. Although ISDN is available everywhere in our territory, you have to be pretty rich in some places to afford it. We are hoping to have 100 percent practical ubiquity for ISDN and expect major progress on the deployment.

Ivan Seidenberg, Chairman, President and CEO of NYNEX

Table 18: Consumer Online Services

	CompuServe	America Online	Prodigy	World Wide Web
Total Subscribers	3.2 Million	3.0 Million	1.2 Million	30 Million (Est.)
Average Age	42	(1)	36	35
Household Income	$93,000	$75,000	$60,500	$60,000
College Education/ Degree	94%	88%	75%	NA
Male	90%	79%	60%	82%
Female	10%	21%	40%	18%

(Source: Marketing Tools, November/December 1995)

(Notes: (1) Age 18-34=37%, 35-44=34%; Microsoft Network is estimated to have 525,000 subscribers)

Electronic Mail:

> E-mail has swept the communications and information world during the past decade, providing instantaneous global information and data exchange. People who send e-mail via the Internet - the amorphous network that links computers worldwide via telephone lines - can correspond with individuals 10,000 miles away as easily, quickly, and inexpensively as they can with neighbors next door. They can communicate with one or many people at the same time. And they can distribute information to any other user as soon as they create it.
>
> However, even though this revolution has broadened and changed the ranks of people with access to information, it has not altered one fundamental feature: An information elite still exists, made up of those with access to and knowledge about computers and e-mail. And as e-mail becomes more pervasive, as more commercial and government transactions in the United States take place online, those information haves may leave the have-nots further behind, unless we make concerted efforts today to provide all citizens with access to the technology.
>
> RAND report, "Universal Access to E-Mail: Feasibility and Societal Implications," 1995

E-mail has joined facsimile document transmission as an essential business tool and increasingly as a vital personal asset and need. It compresses time and distance in the sending of messages and is transmitted at virtually no incremental cost once the equipment and access are in place. The Electronic Messaging Association estimates that the largest 2,000 American companies employ 5 million individuals, transmitting and receiving 6.1 billion messages annually. By the year 2000, the total number of e-mail users worldwide is expected to exceed 100 million.

If any elements of the array of global information applications are to be added to an expanded range of Universal Service capabilities, it must certainly be that individuals have a electronic in-box to receive e-mail and the means to access it. Where available, Free-Nets and civic networks such as AzTeC readily provide e-mail accounts at no charge and are increasingly placing public access terminals around their regions. In some locales, state and municipal governments along with libraries have taken the lead in providing terminals and kiosks to access public records and selected information resources. In the future, they may also provide more general Internet access, allowing users to "pick up" their e-mail. Next generation consumer devices, such as TV set-top boxes and even telephones, may be e-mail enabled. Additionally, a market for "pay" terminals for e-mail and general Internet access may develop, merged with pay phones or similarly distributed. Already some coffee houses and restaurants in urban centers offer patrons computer workstations or phone jacks for portable computer attachment for these purposes. Additionally, commercial network providers may offer "free" e-mail to those willing to accept advertising messages.

Videoconferencing:

Since the widely-seen demonstrations of AT&T's Picturephone at the 1964 World's Fair, the broad availability of personal videoconferencing has been eagerly awaited. Teleconferencing between conference rooms of business people have long since proved its value in connecting remote sites in collaborative meetings, saving travel costs and time while resolving issues and advancing business objectives. The improvements in PC workstation processing capability, access to more bandwidth over corporate LANs, ISDN and other high-speed public network means, improvement in signal compression technology, and worldwide standardization of videoconferencing protocols should finally drive the market resulting in wide deployment of desktop-to-desktop or personal videoconferencing. More than just voice and visuals, documents and drawing will be viewed and annotated by multiple parties (whiteboarding) while files are transferred as background activity. Projects like ECNet (see Arizona Projects and Activities of Note below) are good examples of the value and benefits that can be obtained with the prevalence of full-featured videoconferencing. Telemedicine applications also require such capabilities along with assured security and reliability.

Consumers have been plugging their camcorders or dedicated video cameras into their own PCs and beginning to videoconference on the Internet and by direct dial interconnection. Market penetration by dedicated desktop instruments should follow. At the most recent Comdex show, Panasonic introduced a mobile handheld PCS videophone in the familiar cellular phone form factor. Signs of finally reaching critical mass for video telephony applications in the next few years look positive, but the Year of the Videophone has seemed "real close" for over 30 years now. By the way, not everyone is so anxious to participate in videoconferencing as this quote illustrates:

> In less time than Al Gore can say "national information infrastructure," they tell us, we'll all be hooking video cameras to our computers. If they're right (horrors!), we'll actually have to look at the people we communicate with online. Work-at-homers who pad around all day in flannel PJs and bunny slippers will be on display to clients; hooky-playing employees will have to look the part when they e-mail in sick; and 250-pound, balding guys from Teaneck, NJ, who've been carrying on steamy online affairs under the pseudonym Rip will be exposed for the pudgy-faced impostors they are.
>
> Zach Wolff in Netguide, April 1995

Telecommuting:

> In a country that has been moaning about low productivity and searching for new ways to increase it, the single most anti-productive thing we do is to ship millions of workers back and forth across the landscape every morning and evening.
>
> Alvin Toffler, Futurist and Author

In addition to home-based businesses, many traditionally employed workers spend part of their workweek telecommuting or are simply based by their employer at their own residence. This has a growing impact on traffic, reducing demand on transportation infrastructures and improving air quality. Employers may be able to reduce space needs and overhead, access new labor pools and comply with transportation reduction regulations with increased productivity, recruitment and retention. Employees often consider telecommuting as improving their quality of life with reduction in commute time and associated costs, increased flexibility and family interaction, and improved morale. Telecommuting may offer new employment opportunities for the mobility limited and can aid rural development as distance from one's employer becomes less important to workers. This non-traditional model has proved difficult for some enterprises to adopt and adjust to, but has been largely successful for appropriate job functions.

Advances in telecommunications services and technologies further enable the development and success of telecommuting. The well-equipped home work area may have a second phone line, personal computer and the ability to fax and copy documents. A recent computer modem protocol, DSVD, allows simultaneous voice and data transmission over a single POTS line, perfect for telemarketing, catalog sales and other applications where one needs to converse while accessing data. Technologies such as ISDN further enable these applications with their faster data rates and ability to more rapidly transfer calls from site to site.

Nationwide 9.1 million people telecommute one or more days a week, a 20% increase over 1993's total of 7.6 million. There are 4.2 million additional telecommuters who are self-employed business owners with their primary place of business located outside the home for a total of approximately 13.4 million telecommuters working an average of 7 days per month at home. (Source: Find/SVP, 1994 American Information User Survey). In Maricopa County, almost 93,000 employees (8%) telecommute at least one day per week saving an estimated 600,000 miles of travel and 12 tons of pollution each weekday. (Source: WestGroup Market Research, 1994 Report on Maricopa County Telecommuting)

Lost in Cyberspace - Navigation Tools:

Vannevar Bush, science advisor to President Franklin Roosevelt, published an article in 1945 envisioning hypertext and multimedia. Only recently have those concepts been sufficiently actualized in broadly used products and environments. The Internet and its military/research precedents plodded along for decades involving a growing, yet still minuscule community in its text-based world of e-mail, file transfer and data retrieval. Only with the onset of the World Wide Web several years ago, with its graphic views and point-and-click navigation did Internet use explode to include an estimated 30 million U.S. users, adding to the many millions subscribing to consumer online services.

Even with its vastly improved graphical access, the Internet can remain a foreboding place. As a network of networks, the information content is maintained and delivered from tens of thousands of sites across the planet. Only now are comprehensive hierarchical directories and well-designed search engines reaching common and practical usage, but they often still require inordinate amounts of time and effort to sort through potentially relevant material to find what is needed and reliable. In the government and public policy arenas, what information there is available is often of high quality and utility. But in many other areas of interest, the signal-to-noise ratio (useful and reliable content as compared to useless or misleading) remains much too low. Traditional and new entrepreneurial publishers are establishing a solid presence and electronic journals often deliver timely, valuable information, but there's just too much "stuff" out there.

Software applications and agents will supersede browsers for much of our personal information gathering needs. Customized newspapers, the "Daily Me," will be delivered to your in box or "electronic doorstep." Intelligent agents or Knowbots will have a profile of our needs, preferences, budgets and resources and take "assignments" to visit a vast array of information resources, collecting and sifting data to prepare and present targeted results to us. Such capabilities (i.e., Telescript from General Magic) are being integrated to operating systems and applications for near-term viability.

> The Librarian daemon looks like a pleasant, fiftyish, silver haired, bearded man with bright blue eyes, wearing a V-neck sweater over a coarsely woven, tweedy-looking wool tie. The tie is loosened, the sleeves pushed up. Even though he's just a piece of software, he has reason to be cheerful; he can move through nearly infinite stacks of information in the Library with the agility of a spider dancing across a vast web of cross-references.
>
> "Yes, sir," the Librarian says. He is eager without being obnoxiously chipper; he clasps his hands behind his back, rocks forward slightly on the balls of his feet, raises his eyebrows expectantly over his half-glasses ...
>
> Neil Stephenson in Snow Crash, 1992

Education in the Information Age:

> It is my very strong belief that free connections to the National Information Infrastructure (NII) may not be enough. If we want young people to actively use the technology of the future so it becomes second nature to them, then we must go a step further and provide free usage of the telecommunications lines that will connect school children and young people to new sources of knowledge. The principle of "free" public education for all children is the bedrock of our democracy. Not cheap, inexpensive, or available for a fee but in its very essence "free." We believe in this basic American principle because we know its long-term value for society as a whole.
>
> A child or young person who gets an education of high standards and excellence becomes the worker you can depend on, a better citizen, and a stronger consumer. An early investment in education should have broad application in creating a rate structure for the future use of the NII. Educational institutions, large and small schools, libraries, literacy centers, early childhood centers, community colleges, and universities should have access and usage of these services. If we can't connect the NII with all educational institutions at once, then schools, libraries, and literacy centers should be at the top of the list. I believe that this early investment in education will provide a handsome and long-term economic return to business and to the nation as a whole.
>
> Richard Riley, U.S. Secretary of Education

Technology itself can't provide educational excellence, but it certainly can be utilized as a tool to aid and deliver it. The necessary technological literacy and skills for modern living and productive employment are best learned at an early age. Since the late 1970's and early 1980's, personal computers have been extensively deployed in K-12 and higher education environments. Eventually stand-alone systems were networked to form learning laboratories and share peripherals and resources. More recently, these learning tools have been connected to a wider realm of on-site resources (i.e., school library or administration) and through the Internet to the world at large. A recent study found that in 1995, 37 states provided a connection for their K-12 institutions to the Internet via a statewide education network, up from 29 states in 1993. Seventeen states support their educational networks as a separate budget line item. Federal, state and private funding for such statewide networks was more than $207 million in 1995 ($199 million from state allocations). The same study reports that 6% of Arizona school districts have direct Internet connections and 31% have local dial-in access. (Source: Quality Education Data "Networks Now 1995: A Survey of How Schools Use Telecommunications Networks in Education) Recently, some state Public Utility Commissions have been requiring BOCs to use excess earnings to link schools to the Internet.

The Arizona Department of Education provides local access to the Internet in Phoenix, Yuma, Tucson and Flagstaff through its AzEdLink program. Currently 3,000 users are supported and the department's World Wide Web site offers access to background on their visions and goals as well as access to many educational resources (see Arizona Projects and Activities of Note for more details). Beyond government provided funding, many private initiatives are surfacing to support educational goals through advanced telecommunications services. For example, AT&T has recently announced their Learning Network, a $150 million commitment to put all the nation's 110,000 K-12 schools on the information superhighway by the year 2000. AT&T Capital Corporation offers innovative financing programs for high-tech equipment, software, and even building wiring, with tax exempt lease/purchase as an alternative to bond issues. In California, America Online has offered to connect over 2,000 schools next year providing unlimited free access to its services. President Clinton recently announced that Tech Corps will become a primary means of bringing technology into the classroom by recruiting, placing and supporting volunteers from business to lend technical support to schools in their communities. Many other such opportunities for public-private partnerships will be forthcoming and Arizona needs coordinated efforts in identifying and responding to such potential programs.

In Arizona's higher education environment, Arizona State University through their world-class Computer Commons and statewide outreach through ASPIN, has exhibited vision and persistence in bringing access to advanced information resources to the educational community and beyond. Northern Arizona University's NAUNet has pioneered distance learning, again statewide, with an extensive microwave network and a commitment to content development (again see the section on Arizona Projects and Activities of Note for more details). The Western Governor's Association has articulated a vision of a degree-granting "Virtual University" through their SmartStates program, foreseeing regional cooperation in distance learning for cost-effective, high quality delivery of higher and adult education. From the land-grant universities of the 19th century, America has committed its resources to the development and support of its higher educational institutions. In the past, this often meant the funding of physical infrastructure, institutions that students came to. In the Information Age, this support will hopefully translate to deployment of high technology infrastructure and applications, enabling the institution's offerings to be participated in "virtually" or remotely.

Electronic Democracy and Access to Government Information:

> With one simple click of the mouse, one is granted rights of citizenship into a virtual community of individuals that spans the globe. As the Internet, including the World Wide Web and the various online services available today, has grown, so, too, has the ability of the individual to participate in discussions on issues of regional, national, and even global importance without the usual constraints which have traditionally limited meaningful discourse among groups of individuals (cost, distance, ease of communication, geographical barriers, etc.). We cannot fully appreciate at this moment the impact this revolutionary way of communicating ideas will continue to have on reasserting the true creative and expressive potential of the individual in our democracy. The freedom of individuals, without regard for class, nationality, or ideology, to express their viewpoints, is an essential part of the Internet and the online community. Such freedom stands in sharp contrast to the "group-think" of recent decades that was perpetuated by those who still believe in a top-down "Washington knows best" attitude. The ability to engage in an electronic forum on flat taxes, welfare reform, term limits, or virtually any other issue of importance to an individual or group of individuals is helping to overcome the once wide gap between Washington and the American people.
>
> Newt Gingrich, Speaker, U.S. House of Representatives in Boardwatch, December, 1995

The foundations of effective democracy are built on an informed citizenry, empowered to express their views and offered the opportunity to interact with and perhaps influence the policies of their government. The Federal and state governments act as enormous repositories of information that they collect and generate. Tradition and law mandate the availability of this wealth of data and electronic access is coming to offer the most versatile, logical and cost-effective means of delivery. The Federal government has undertaken with visionary zeal the development of a National Information Infrastructure and initiated efforts at all levels of government to reengineer itself and provide citizen services via advanced information access programs. A wide range of coordinated efforts and already successful programs are underway as detailed in Appendix B - Telecommunications Policy Resources.

> The web transformed the Internet from an often difficult and confusing search for information to an entertaining and rewarding journey through a wealth of material in what amounts to a global electronic library. And it brought the government - both federal, state and local - into its embrace. It's hard to find a federal office, state capital, or even a city that isn't represented on the Internet. Government may fall short in many areas, but in cyberspace it has delivered with a comprehensiveness and enthusiasm that wins applause across the country. That information would cost a lot of money if you tried to get it from other sources, so there's a lot of value out there.
>
> James Evans in Government Technology, November, 1995

Many states have undertaken similar initiatives to develop an Internet presence and deliver a broad range of information and services through this new medium. Almost all the states have home pages as an entry point for citizen access. An estimated 36 states have Legislative home pages and about 20 offer legislative tracking, if not the full text of laws and bills. (Source: Government Technology, December, 1995)

Arizona state government has provided an official home page for some time. A number of state departments have their basic mission and contact information available and depth of content continue to slowly develop. The Arizona Departments of Commerce and Education have the most advanced scope of services on the World Wide Web at this point, but the Arizona Corporation Commission's STARPAS dial-in service is most indicative of the depth of public record access that should soon develop.

> If you think of what government does, it is often the collection of information, the recording of official information, and the compilation of statistics. Yet much of what is collected and maintained by government just sort of sits there in primitive records that are sometimes accessible electronically. Yet the government is often protective of information because, certainly within the departments, there's an awful lot of turf protection in the data they collect. If government took its role as one of making information available and providing accessibility, we would see a lot more confidence by the public in government.
>
> What was clear was that for a new generation of leadership, public accessibility is part of regaining trust. In my experience as a legislator, when I went online, I immediately got a lot of e-mail from people saying it's about time, this is overdue, we've used this at work for 10 years, I'm so glad that I can contact you as a constituent. Many of them are people who probably would have never written a letter, gotten a stamp or gone through that whole process. Yet, they wanted to feel like they could be in touch and I had a wonderful experience with that.
>
> Earl Baker, former U.S. Senator from Pennsylvania, VP of Unisys Corporation in Government Technology, December, 1995

Notably, former Arizona Representative Sam Coppersmith, with the aid of ASU and ASPIN, was the first member of the U.S. Congress to go beyond e-mail to provide positions, surveys and constituent services on the Internet. The Arizona Legislature is planning an extensive World Wide Web presence for the 1996 Legislative Session. They should utilize the Governor's Office of Telecommunications Policy and the Department of Administrations Chief Information Officer to determine the range of information resources provided by other states and how they are funded, managed and delivered. And with this information, determine how best to provide encouragement or mandate that the divisions of Arizona state government move forward in the electronic provision and citizen access to public information and records.

> A popular government, without popular information or the means of acquiring it, is but a Prologue to a Farce or a Tragedy or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own Governors, must arm themselves with the power knowledge gives.
>
> James Madison, 4th President of the United States, 1822

Virtual Communities in Cyberspace:

The original intent behind the development of the Internet's predecessor, ARPANET, was the linking and sharing of supercomputer resources around the nation. As researchers and scientists at Universities and centers began to communicate by e-mail, the value of such collaboration became unexpectedly and quickly of significant importance to the progress of their work. Virtual communities of interest arose and over the ensuing years many others got connected and joined in leading to tens of thousands of sites, news groups and mailing lists dedicated to their own often narrow nexus of interests, applications and goals.

"Smart connections" mark a fundamental change in the way we are able to communicate in the new digital world. In this new world, more and more people are using their personal computers to create digital content. Smart connections, which are the combination of the intelligent personal computer and the communications infrastructure, advance everything from medical practices to business transactions. They enhance the way we work, play and learn.

Technology can bring to life a virtual community of people while they are visiting a site on the World Wide Web. This is a smart connection that is right around the corner. People thousands of miles apart can seem to gather in a single room. By the end of the decade, personal computers will become the most ubiquitous consumer device in the world, surpassing the television in worldwide unit sales. PCs will stand alone as the most versatile and most cost effective way to bring people and information together.

Andrew Grove, President and CEO of Intel, in America's Network, November 1, 1995

Information Services Haves and Have-Nots:

It is sometimes thought that there is a magic solution to building the Global Information Infrastructure (GII) - for example, that the answer is the Internet, or that it is broadband ISDN, or that it is interactive cable television, or that it is future generation wireless technologies. Personally, I do not believe that there is a magic solution of this kind that some "revolutionary technology" or "killer application" will conquer the world. It is more likely that the GII will be a "network of networks" and evolve out of existing technologies and services, just as communications has always done. Let me suggest that we also have a compass - a moral compass - that should point us toward paths that maximize values such as universal access, the right to communicate and diversity of expression. These values are fundamental not only to communications, but to the democratic evolution of mankind.

Pekka Tarjanne, Secretary General of the International Telecommunications Union (ITU)

As we move from the traditional measurement of Universal Service by telephone penetration rates to attempts to quantify Universal Access, the variety of possible services and content and the wide range of delivery mechanisms hinder any easy definition. Early analysis of technology availability (computers and modems) against demographics, such as the recent National Telecommunications and Information Administration's "Falling Through the Net: A Survey of "Have Nots" in Rural and Urban America," indicate many of the same populations are underserved. Information "have nots" are disproportionately found in rural areas and the inner cities. Not surprisingly, they also closely track the distributions of telephone penetration for race, age, region, income, and level of education.

It is not likely that as formal and encompassing a program as supported Universal Service will arise to meet the needs of the "have nots" in the Information Age. But it is necessary that the same traditional populations are targeted by a majority of the many efforts and programs that are put in place. In the absence of a national definition and plan, though not without vision and support, states and localities must take the initiative to identify and participate in broader regional and national initiatives, and where those are lacking or not appropriate or adequate for their populations, define their own.

If systems like the Internet become critical parts of national and global infrastructure, then universal access to them will be vital. Public policies that encourage universal availability of access would be a logical and desirable outcome. I hope and believe that it will be possible to provide universal access through competitive cost reduction and where appropriate, business incentives. Alternatives that apply regulatory methods to achieve this goal are often found to be inimical to good business practice and therefore, artificial and risky at best.

Vint Cerf, VP of Data Architecture at MCI Communications Corp. and Internet pioneer

Enabling Access for Persons with Disabilities:

Technology has always proved a great enabler, a way to multiply strength or speed tasks or perform the otherwise impractical. It has similarly reenabled those with disabilities, often returning to them the mobility and capability to achieve greater independence in their personal, social, recreational, educational, and vocational activities. The amazing advances in assistive technology continue to arrive at a rapid pace, returning a semblance of lost senses or skills to the disabled. Technology transfer from advanced space, military and communications programs feed an industry supported by dedicated research institutions.

The other side of the issue is that the common telecommunications functions widely deployed in society should remain accessible. This has driven the Telephone Relay Services inclusion in Universal Service, the requirements for hearing aid compatibility of telephones, the wide availability of closed-captioning for television, the accessibility of Braille and audio books, among others. With the graphical nature of the modern computer and information access systems, care must be taken in the development of standards and the specific design of products and services to include as much as possible those with disabilities. By enabling optional input and output devices and formats, delivery of information services can continue to reach the broadest possible population. Speech output can be substituted for the graphic display while voice recognition or alternative input devices other than keyboards and mice can allow navigation and data entry. Standards and requirements for such capability will be driven at the national and international level, but it falls largely to the states and localities to provide programs and social support structures to propagate the equipment and support services necessary.

Electronic Commerce and Security:

Electronic Data Interchange (EDI) is the means by which businesses can conduct paperless, instantaneous, secure transactions. It greatly reduces transactional costs and is increasingly required by government entities and large businesses for those vendors wishing to deal with them. As harmonized international EDI business documents mature, ever more of our trade and monetary flows will pass this way. Though much EDI moves through clearing houses and third parties, it will increasingly shift to the level of direct transactions between parties on secure public networks.

Indeed, security is quickly reaching practical levels and will soon be embedded in operating systems and applications as a ubiquitous function to authenticate those in a transaction, authorize purchases and payments, secure the privacy of the matter and enter into legally binding arrangements. Much consumer electronic commerce is already taking place on the Internet via unsecured credit card purchase or to a small extent, with one of the early forms of digital cash. Some consideration for state and localities, are the issue of sales tax obligations in cyberspace, the tracking of interstate and international cash flows and the enabling and encouragement of such electronic commerce (i.e., California and Utah have enacted digital signature legislation).

> Sending a credit card number to an electronic merchant over the Internet is probably the safest way to make such a transaction. In the last week, for example, I handed my credit card to a waiter who disappeared with it for five minutes. I faxed my credit card information to a business in New Jersey, and the fax probably lay exposed to everyone in that office for hours and perhaps to the cleaning crew that night. I called a hotel and gave my credit card data to a reservation clerk and continued my recklessness by ordering some merchandise from a clothing catalog, again by reading my credit card information to some unseen operator. Compared with the risk of handing my credit card to a stranger, which I do nearly every day, sending it over the Internet is pretty secure.
>
> Peter H. Lewis, journalist in the New York Times (November 13, 1995)

Privacy, Censorship, Copyright and Civil Liberties:

> Everybody's watching me. You know all those articles about "Will They Spend?" Well, I'm one of **them**. Just as people are sick of polls in the weeks before elections, and predictions about who will be in the Super Bowl before the play-offs begin, I am sick of the blow-by-blow reports on retail sales figures during the so-called Holiday Season. Suddenly you feel as if you are letting your country down if you are not spending. One Jingle Bear too few and you're the consumer equivalent of a Pledge of Allegiance refusenik.
>
> Alice Kahn in Luncheon at the Café Ridiculous, 1990

In this time of enormous transitions, the whole basis of our rights and civil liberties must be reevaluated in light of emerging information and telecommunications technologies and the societal shifts they drive. The issues are plentiful, complex and often interrelated.

On the issue of citizens' privacy, one must consider the ability to accumulate and coalesce a digital picture of an individual's spending and habits and apply that to marketing or investigation. In Europe and many other countries, the secondary use of much marketing information openly brokered here, is controlled or prohibited. The availability of strong cryptography has been particularly contentious of late as the Federal government has proposed requirements enabling authorized surveillance and retaining strict export controls, which has been met by unprecedented industry and public resistance and activism. The privacy of e-mail at work or in public transit, the possibilities of anonymous messaging, the personal and intense nature of "flaming" in electronic discourse, all are elements of a broad and difficult debate.

The many new forms of publishing, both new media itself and the forms of transmittal are forcing reexamination of our intellectual property laws, especially in the area of copyright. The ability to readily copy the works of others grew with the advent of the photostat machine and with the digitization of word, image, and content in general, the potentials for digital copying and transmittal enormously complicate the rights of ownership, reproduction, royalties and fair use. Significant efforts to redefine copyright laws and adapt them to new media are underway as authors, publishers, libraries, and users meet in concert with policy makers, but expect some bumps in the road.

> As a desktop publishing medium, the World Wide Web harkens to the old model of pamphleteering, where anyone has the right to advertise opinion without censorship or editorial interference. How far can we go down this aesthetically and sociologically independent path before regulators and other forces converge to tame it, imposing a layer of moderation or editorial control between author and audience.
>
> Glorianna Davenport, MIT Media Lab in IEEE Multimedia Fall, 1995

Where do we set the limits of free speech in this new world of communication possibilities? Are the telecommunications providers a common carrier with no responsibility for the messages they transmit, are they publishers with the liability for content that ensues, or are they somewhere in between? Do images or content transmitted between individuals over state or national borders have to meet the "community standards" of both the sending and receiving sites to not be assailed as pornography? Fortunately, their are now voluntary industry efforts underway for "content labeling" and tools for filtering or blocking access to specific sites or types of materials. Parents and schools must assume some substantial responsibility for the protection of minors and methods to limit and monitor access will become increasingly prevalent.

Some of the most interesting and contentious issues on the new frontier concern these issues. It is well beyond the scope of this report to survey this broad landscape and even suggest solutions. However, in the Resource Guides (Appendixes B and C) are details and contact information on many public policy players active in this debate for your further investigation and consideration.

Arizona Projects and Activities of Note:

(Note: Contact information can be found in Appendix B - Telecommunication Policy Resources)

Arizona State and Municipal Government:

Arizona Corporation Commission (ACC)

State of AZ Public Access System (STARPAS) provides dial-in access via computer modem to information on corporations, limited liability companies, trademarks, tradenames, and limited partnerships having a business presence in Arizona. It is a fee based system requiring a modest $36. startup fee and a deposit account with the ACC to cover the $.50 per minute usage fee. It is a good model of providing state public records to the business and legal communities, but the deposit account model precludes casual or occasional public usage.

Arizona Department of Education (ADE)

AzEdLink is the department's current Internet access service for the K-12 educational community. For an annual fee of $35, public school instructional, administrative and support staff members as well as affiliated community members and students (currently a total of 3,000 users) dial-in via computer modem for full Internet access. The 800 service used in the pilot program has been discontinued due to traffic and cost, but in addition to Phoenix local lines, Yuma, Tucson and Flagstaff have local access. ADE (along with the Department of Commerce) has the most thoughtfully designed and useful World Wide Web site in Arizona government with their visions and goals readily accessible as well as pointers to K-12 schools hosting their own Web presence and links to many educationally related resources.

Governor's Office of Telecommunications Policy

The Governor's Commission for the Study of the Telecommunications and Information Industry in Arizona in their January, 1995 report had as their first recommendation that the state "develop visible and effective leadership for telecommunications" by establishing the Governor's Office of Telecommunications Policy to "proactively advocate, coordinate, mediate and educate Arizona residents and policy makers on telecommunications issues." Last session, the legislature enacted Senate Bill 1258 creating the office which has been in operation since July.

Arizona State Legislature

The State Legislature has promised a World Wide Web presence for the 1996 Legislative Session. The Arizona Legislative Information System (ALIS Online) will carry a full range of legislative information:

Members' biographies, committee assignment, and sponsored legislation
Committee background, membership, agendas, and assigned bills
Status and full text of bills as well as the floor calendars
Full text of Arizona Revised Statutes (ARS)

City of Phoenix

PhoenixNet is an initiative to provide broad electronic service and information to citizens, specifically targeting elderly, disabled, and economically disadvantaged citizens. Senior centers, community centers, libraries and non-profit special needs centers dispersed throughout the city are being equipped with workstations for public access to city information and services, some including assistive technology for the disabled. Aided by grants from the Telecommunications & Information Infrastructure Assistance Program (TIIAP) of the National Telecommunications and Information Administration (NTIA), Phoenix has a well thought out and organized plan to develop online information resources and going beyond general public access, to insure including targeted under-served populations.

City of Tucson

The Community And City of Tucson Information NETwork (CACTI-NET, formerly METCOM) has served the Pima County community for several years by providing electronically accessible government, local business and community information about the southern Arizona region. Their offerings include a significant body of trade, business and economic resources. In addition to their local dial-in access and gopher presence on the Internet, they serve as Tucson's gateway to the AzTeC Free-Net (see below) and are developing their World Wide Web presence for introduction in 1996.

Arizona Higher Education and Public Institutions:

Arizona State University (ASU)

Arizona State Public Information Network (ASPIN), based at ASU, assists Arizona's public organizations and communities in connecting to the Internet. Phase I connected the three primary urban areas of Flagstaff, Phoenix, and Tucson with a state-wide backbone and within these urban areas they have provided connections to many organizations (over 50 in Phoenix). Phase II , aided by NSF funding, extended the backbone out to the state's eight rural community colleges and from their into their communities. Phase III is a proposed plan to connect Arizona's K-12 schools to the backbone developing a robust educational network. ASPIN also staffs and supports three state-wide Network Information Centers (NICs) providing a one-stop ready reference point and help desk for Internet users. ASPIN will assist Navaho Community College, who just received a NTIA TIIAP grant, in establishing the Navajo Learning Network (NLN) connecting seven community college campuses and eventually all K-12 schools throughout the Navajo Nation as a single virtual campus linking educational and community resources.

Northern Arizona University (NAU)

Northern Arizona University Network (NAUNet) is an instructional interactive television (distance learning) system that NAU is building throughout Arizona encompassing over 20 independent sites with an extensive microwave network. NAUnet's classrooms are on the campuses of NAU, ten community colleges, and five rural school districts. The NAU Learning Alliance (nauLA) is a network of more than 100 satellite downlink sites across Arizona that participate in NAU satellite programs. Also joining with Missouri, Oklahoma and Washington leaders in satellite education, NAU has formed IdeaNet to connect 2,000 schools in 33 states to an interactive television and computer network, as well as provide a wide range of programming.

University of Arizona (U of A)

Arizona Health and Information Network (AZ-HIN) is a non-profit consortium of Arizona teaching hospitals and health science educational institutions based at the Arizona Health Sciences Center. AZ-HIN uses the Internet to connect hospitals, libraries, teaching and health care institutions, and to provide access to health literature databases, other information and education products. The Biomedical Communications department of the Arizona Health Sciences Center produces medical and health related teleconferences, participated in from around the state and offers classes to the three state universities via NAUNet.

Economic Development Information Centers (EDICs)

Located throughout Arizona, 28 public and community college libraries have established Economic Development Information Centers to support their local business communities and provide the information local businesses and economic development practitioners need. A core collection of business reference materials and a staff person familiar with business resources, the local economy and community are available. The EDIC staff also provide referrals to other business information specialists and support organizations, as well as performing database searching and utilizing Internet access to meet the business patron's needs. Seed money came from the federal Library Services and Construction Act while ongoing funding comes from local support and federal grants.

Arizona Associations and Industry:

Arizona Procurement Technical Assistance Network (APTAN)

APTAN is a non-profit economic development corporation that assists participating businesses in identifying and competing for federal, state, county, and local government contracts. Their computer system matches company capabilities, products and services to procurements from federal, state, county and municipal agencies, state universities and other public institutions, automatically notifying businesses of opportunities matching their stored profile. Further assistance is provided in preparation of bid packages and access to technical support information. Their Arizona Automated Vendor Inquiry System (AAVIS) allows nationwide targeted access to business profiles on over 6,300 Arizona companies.

Arizona Technology Access Program (AzTAP)

The Institute for Human Development at Northern Arizona University is the lead agency for the AzTAP program. Their mission is to increase access to assistive technology (AT) devices and services for individuals and their families. AT devices are increasingly high tech enabling access to computers and networks or through devices embedding high technology, returning function and capability to the disabled. AzTAP provides an 800 hotline for information and referral, recycling of used or abandoned assistive technology equipment, access to AbleData (an extensive database of assistive technology products), and also offers training, research and advocacy

Arizona Technology Development Authority (ATDA)

ATDA was created by the Legislature in 1993 to help Arizona firms secure federal high technology development grants. However, the last two legislative sessions have not provided the requisite funding. Last year, House Bill 2131 would have provided up to $6 million over two years as potential matching funds. Without such funds from state government, regional industry consortiums or other public-private sources, federal grants are not likely to be awarded. Twenty nine other states do have a similar authority that can provide a competitive advantage in attracting and retaining high technology firms.

Arizona Telecommunications and Information Council (ATIC)

ATIC is an economic development foundation under the Governor's Strategic Partnership for Economic Development (GSPED). Their mission is to drive implementation of an information applications and telecommunications infrastructure that will support economic growth in Arizona. ATIC provides a forum for telecommunications issues, education and advocacy involving a diverse range of public and private partners including large and small business users of telecommunication services, economic development organizations, libraries, consumer organizations, local and state government agencies, educational institutions, health care, the Arizona Corporation Commission, the Arizona Legislature, and information technology and telecommunication companies.

Arizona Telecommunication Community Computing (AzTeC)

AzTeC is an Free-Net developed to provide noncommercial access to the Internet. AzTeC serves up a variety of local information (including municipal background, news and events) and provides e-mail accounts and limited Internet access for approximately 12,000 Phoenix area residents (currently only local dial-in phone lines are provided). They are linked to many other nationwide and worldwide community-based Free-Nets and are working to site public access terminals in convenient locations throughout the community (10 in place so far).

Arizona Telecommuting Advisory Council (AzTAC)

AzTAC is a statewide telecommuting advocacy and information resource center, dedicated to making telecommuting a recognized alternative to travel for a broad range of needs. They provide telecommuting resource information and assistance to organizations, as well as holding educational seminars, workshops and

conferences. In Maricopa county alone, 93,000 employees now telecommute an average of one day a week saving 600,000 miles of travel and 12 tons of pollution each weekday.

Datalink Project

Datalink has been funded by the Arizona Legislature for study and pilot trials the last two years. Its focus is the facilitation of trade within the Pacific NorthWest Economic Region (PNWER) and throughout the NAFTA (CANAMEX) trade corridor via the discovery, cataloging and routing of trade related information such as trade leads and access to databases about companies, government agencies, and industry focused associations. Consultants have developed a pilot World Wide Web site and proposed a range of models and implementation strategies. Decisions on funding, ownership and execution are pending.

Electronic Commerce Net (ECNet)

ECNet has been one of the first broadband metropolitan area networks (MAN) to be implemented and tested within the cable industry. A joint pilot project of Cox Communications, Digital Equipment Corporation and Arizona State University, EC Net has connected approximately 12 Phoenix manufacturing companies to support collaborative engineering, improve productivity, enhance product quality and reduce time to market for new products. Utilizing the existing hybrid fiber/coax cable network to achieve 10 Mbps Ethernet connectivity, this demonstration project can evolve to serve videoconferencing, concurrent CAD, multimedia warehousing, telecommuting and high-speed Internet access needs in the years to come.

Recommendations for Arizona Action - Updating the Social Contract:

The Arizona Corporation Commission (ACC) has new rules pending that will establish a formal and well structured Arizona Universal Service Fund (AUSF). Upon approval next year, Arizona will join some 16 other states with similarly well defined and established programs. The ACC's rules define "basic local exchange telephone service" in a manner consistent with other states and retain the intent to equalize for rural areas the cost and quality of basic service, the most fundamental tenet of Universal Service. Notably, these rules anticipate the competitive entry of providers in the local loop market, spreading the contributions to the fund across all providers of basic local exchange service (as an access line surcharge) and providers of intrastate toll service (as a percentage of intrastate toll revenues). The movement from "study areas" to the more precisely defined and smaller U.S. Census Blocks, combined with the availability of approved subsidies to competitive providers on a per customer basis will encourage (but not insure) competitive entry into the high-cost areas of the state.

The impact of Federal legislative and Federal Communications Commission initiatives may well drive new scope, criteria, and responsibilities down to the state Public Utility Commission (PUC) level. The pending Federal-State Joint Board will be empowered to redefine Universal Service in terms of what minimum services it should guarantee and how they are to be funded and administered. Whether advanced information services are included in a new basic service definition or whether specific rural or public institution infrastructure funding or incentives for such services will develop, remains to be seen. The state Public Utility Commissions will certainly retain significant oversight and management, but a range of possible new directions including a "voucher" system to high-cost subscribers, block grants to the states, new calculation methodologies for geographic areas and cost basis (perhaps with proxy factors), will drive near continuous adaptation for the foreseeable future. The Arizona Corporation Commission should look to organizations such as the National Association of Regulatory Utility Commissioners (NARUC) and the National Regulatory Research Institute (NRRI) for ongoing insight to the changes occurring, model regulations and programs, as well as how state PUCs around the nation are handling the federally driven evolution of Universal Service.

Over a dozen states are "thinking out of the box" of traditional Universal Service, in that through state PUC administered rate cases or fines placed on carriers, excess earnings and penalties are being collected and applied to advanced information services development, infrastructure and deployment. These substantial pools of funds (ranging up to $500 million in Georgia) are being used to fund Internet connections for schools and libraries, distance learning applications, telemedicine and citizen access programs, as well as rural telecommunications infrastructure development. In light of the inevitable shrinking of Federal dollars to fund such initiatives, it is recommended that the Arizona Corporation Commission survey their legal structure, rules and situation to determine whether such funds could be similarly accumulated or negotiated for in Arizona and invested in these kinds of advanced information services and access. If prohibited by existing factors, the ACC and the Legislature should consider steps to enable and encourage pursuit of such telecommunications reinvestment.

Rural telephone rates and infrastructure development have been at the core of Universal Service as rural areas with their lower population densities and greater interconnection distances have always encompassed the majority of high-cost subscribers. Just as programs in rural electrification aided the development of infrastructure for electricity and telephony, rural datafication is needed today. The new realities of economic development are not based as much on land or natural resources as in the past, but rather on human resources, the skills and education of a region's workforce. As physical transportation of goods is displaced increasingly by the delivery of services, aided by the conveyance of data and information, the availability of adequate telecommunications infrastructure is becoming as important as the highways and railways of yesteryear. Promising technological advances will aid equality of service cost and capabilities, but as always, rural deployment will lag urban areas and attract fewer competitive entrants. The subsidized connection of schools, libraries and health facilities will offer a safety net for those who can't afford their own personal connections to the National Information Infrastructure. They may then get direct access at public locations or at least the benefits of their educators and health care providers having such access. Distance learning, telemedicine and videoconferencing can allow the utilization of specialists and experts on an as-needed basis from remote locations, expanding the base of knowledge and expertise available.

Even as available Federal funds shrink, many current programs will yet continue and some new ones will be initiated. For example, the USDA's Rural Business Telecommunications Partnership Loans and Rural Telemedicine Grant Program are developing and expanding while the NTIA continues its ambitious grant programs. Industry is also stepping in, particularly the high technology sector, shifting their public service contributions to educational and infrastructure projects. These amounts can be significant as with AT&T's recent announcement of $150 million for K-12 Internet connectivity and services. Regional initiatives such as the Western Governor's Association SmartStates offer collaboration and leverage by partnering with other states in the development and deployment of applications and services. It is recommended that the Governor's Office of Telecommunications Policy take the lead in identifying such public and private programs, qualifying the likelihood of Arizona participation, disseminating the pertinent information, fostering coalitions of participants and facilitating the necessary response and follow-up. Only through such coordinated and concerted effort can we expect Arizona to fully participate in these programs and funding sources.

The strength of democratic institutions and governments is founded on the rights of its constituents to be aware of its doings and remain well informed, so as to form opinions, express their viewpoints, and incorporate those perceptions and information into the fabric of their life and livelihood. Government initiatives and dissemination of a wide range of information also serves the needs of its business community and fosters economic development. Every state in the union has begun to offer its records and resources in electronic form to aid in its own operation, to better serve its citizens and to protect and foster the public interests. We recommend that the Governor's Office of Telecommunications Policy and the state's Chief Information Officer undertake to determine the range of information resources provided by states and localities and their manner of funding, management and delivery. Further, it is hoped they will benchmark

the "best practices" among states, consider where public-private partnerships may prove effective and beneficial, and recommend coordinated and progressive Arizona development in this area. The Legislature can then consider enabling and promoting future progress by mandates, incentives and coordination of funding.

In moving to make a wide-range of state government information and resources available electronically and recognizing the growing importance to modern life of accessing these and the wealth of other information assets and the ability of electronic communication to foster communities of interest, the state must also consider the means of citizen access. It is here that the long-held social compact providing Universal Service to insure access to basic telephony must evolve to a concept of Universal Access to best preclude information have-nots in the Information Age. For the citizens who live in high-cost areas or who cannot invest in the equipment and services to provide such access, the state should encourage, enable and/or provide the means of access at a community level. This may to some extent be served by the competitive telecommunications marketplace in an increasingly deregulated environment, but should also be aided by incentives or programs for the connection of schools, libraries, health institutions and the fostering of community networks.

The ideals of inclusion basic to Universal Service have always gone beyond rural access to also embody aid to the low-income and disabled segments of our population. Appropriate assistive technology must be incorporated into any and all information access initiatives to insure that every citizen may participate and benefit. Consideration should be given to e-mail as a new "basic service" enabling participation in the sending and receiving of electronic messages. Though civic networks and both public and private institutions may provide electronic mailboxes at low or no cost, the means of remote access from community level resources should be provided to best serve low-income and mobile populations.

As the National Information Infrastructure extends its reach, capabilities and importance, Arizona, with its current initiatives, high technology industry base and electronically literate citizenry, is well positioned to take advantage of the transformation from the Industrial Age to the Information Age. The premises of traditional Universal Service remain valid today, but the scope and expectation must evolve to a broader concept of Universal Access as we undergo a paradigm shift in citizen's use of telecommunications.

Electric circuitry has overthrown the regime of "time" and "space" and pours upon us instantly and continuously the concerns of all other men. We now live in a global village.

Marshall McLuhan, 1967

UNIVERSAL SERVICE TO UNIVERSAL ACCESS

Appendix A - Bibliography

Note: With the rapid pace of technological advancement in telecommunications, any bibliography provides but a brief and quickly outdated view of the state of affairs. This appendix lists some of the materials we have found useful, but we encourage you to rely more on the extensive resource guides in Appendixes B and C to keep up to date in the areas of most interest to you. Also, increasingly, some of the most topical and timely items appear in "non-traditional" forms, that is in electronic form on the Internet, never being formally published in hardcopy.

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UNIVERSAL SERVICE TO UNIVERSAL ACCESS

Appendix B - Telecommunication Policy Resources

State of Arizona Resources:

Arizona State Government:

Arizona State Government Home Page URL - http://www.state.az.us/
Arizona State Agency Index URL - http://www.state.az.us/pages/agencyin.htm

Arizona State Legislature

(URL - http://www.azleg.state.az.us/) With the 1996 Legislative Session, the **Arizona Legislative Information System (ALIS) Online** carries a full range of legislative information including: members' biographies, committee assignment, and sponsored legislation; committee background, membership, agendas, and assigned bills; status and full text of bills as well as the floor calendars; full text of Arizona Revised Statutes (ARS). Some unofficial legislative tracking information has been available from ASU as furnished by the Arizona Capitol Times (URL - gopher://info.asu.edu:70/11/asu-cwis/pctp/legact).

Arizona Corporation Commission (ACC) State of AZ Public Access System (STARPAS) (1300 W Washington, Phoenix, AZ 85007, (602)542-4251, fax (602)542-2129)

The ACC STARPAS provides dial-in access via computer modem to information on corporations, limited liability companies, trademarks, tradenames, and limited partnerships having a business presence in Arizona. It is a fee based system requiring a $36. startup fee and a deposit account with the ACC to cover the $.50 per minute usage fee. Access through public libraries and Internet is being considered.

Arizona Department of Commerce (DOC)

(3800 N Central Ave., Building D, Phoenix, AZ 85012, (602)280-1480, fax (602)280-1384, URL - http://www.state.az.us/ep/commhome.shtml) The DOC provides perhaps the most extensive and best developed Arizona state government Internet site to date. Some resources of interest to be found here include: **Arizona Business Assistance Center** (with its **Arizona Business Connection**), **Arizona Film Commission, International Trade and Investment, National Marketing** (business relocation support), **Office of High Technology**, and **Strategic Planning**.

Arizona Department of Economic Security (DES)

The DES **Telephone Assistance Program (TAP)** provides telephone service to households with low incomes and a medical need that requires a telephone in the home. TAP has been in existence since 1991 and currently serves about 7,000 households (in US West territory only). For further information, contact the **Community Services Administration** at (602)542-6600 or (800)582-5706.

Arizona Department of Education (ADE)

(1535 W Jefferson, Phoenix, AZ 85007-3209, (602)542-4361, URL - http://www.ade.state.az.us/) **AzEdLink** is the department's current Internet access service for the K-12 educational community. For an annual fee of $35, public school instructional, administrative and support staff members as well as affiliated community members and students (currently a total of 3,000 users) dial-in via computer modem for full Internet access. The 800 service used in the pilot program has been discontinued due to traffic and cost, but in addition to Phoenix local lines, Yuma, Tucson and Flagstaff have local access. On their World Wide Web one can view ADE's visions, goals and programs as well as pointers to K-12 schools hosting their own Web presence and links to many educationally related resources.

Arizona Department of Environmental Quality (ADEQ)

(3033 N Central Ave., Phoenix , AZ 85012, (602)207-2300, (800)234-5677) ADEQ runs a voice **Information Center** service at (602)207-2217, an **Environmental Education Program** at (602)207-4145,a **Technical Assistance Program** at (602)207-4337 and the **Environmental/Recycling Hotline** at (602)253-2687 or (800)947-3873. ADEQ is developing electronic access to their publications.

Department of Library, Archives and Public Records (DLAPR)

(State Capitol, 1700 W Washington, Phoenix, AZ 85007, (602)542-4035, (800)255-5841, fax (602)542-4972, URL - http://dlapr.lib.az.us/) The DLAPR was formed in 1937 as part of the state Legislature, serving the information needs of Arizona government and citizens by providing access to unique historical and contemporary resources. The **Records Management Division** facilitates the handling of government public records and the **Arizona State Archives** at (602)542-4159 makes them available to the public.
The **Braille and Talking Book Library (BTBL)** loans recorded books and magazines as well as the equipment on which to play them ((602)255-5578, (800)255-5578). The **Arizona Newspaper Project** at (602)542-3701 is cataloging and microfilming over 1500 Arizona newspapers published since 1859. The catalog will be developed into an Internet accessible resource in 1996.

Governor's Office of Telecommunications Policy

(1700 W Washington, Phoenix, AZ 85007, (602)542-0142, fax (602)542-0134, e-mail - jkelly@ad.state.az.us, URL - http://www.state.az.us/tpo/) The Governor's Office of Telecommunications Policy was established to develop visible and effective leadership for telecommunications and to proactively advocate, coordinate, mediate and educate Arizona residents and policy makers on telecommunications issues. Last session, the legislature enacted Senate Bill 1258 creating the office, which has been in operation since July, 1995. Look for the content and resources of this report on their Internet site. The **Governor's home page** can be found at URL - http://www.state.az.us/gv/index.html .

Arizona Non-Governmental Resources:

Arizona Broadcasters Association (ABA)

(3101 N Central Ave., Suite 550, Phoenix AZ, 85012-2639, (602)274-1418, fax (602)631-9853) The ABA is the official trade association serving all radio and television stations in Arizona with government relations support as well as acting as a clearing house of information for all FCC and National Association of Broadcasters departments. 1995 membership included 63 radio and 22 television stations.

Arizona Cable Television Association (ACTA)

(3610 N 44th St., Suite 240, Phoenix AZ, 85018, (602)955-4122, fax (602)955-4505) ACTA represents Arizona cable television companies providing publications and research as well as working with state and federal lawmakers, the Arizona Corporation Commission and municipal government to implement positive programs and resolve issues for the cable television industry.

Arizona Consumers Council

(PO Box 1288, Phoenix AZ 85001, (602)265-9625, Tucson (520)327-0241) The Arizona Consumers Council is an educational, research and advocacy consumer organization. The Council works with state and national consumer and other organizations to promote legislation to protect and give consumers a voice in marketplace decisions conducting fairs, workshops, seminars and conferences on consumer issues.

Arizona Education and Information Telecommunications Cooperative (AEITC)

(contact Dr. William Lewis, Vice Provost for Information Technology, Arizona State University, (602)965-9059, e-mail - william.lewis@asu.edu) AEITC encourages and advances cooperative planning and development of educational and informational telecommunications in the State of Arizona. Originally formed in 1988, the organization is currently being reorganized and reactivated.

Arizona Electronic Commerce/Electronic Data Interchange Roundtable (AZ EC/EDIR)

(c/o Dave Darnell, SysTrends Inc., 1850 E Carver Rd., Tempe, AZ 85284, (602)838-5316, fax (602)897-8479, e-mail - dave_d@systrens.com) AZ EC/EDIR is an informal, cross-industry Electronic Commerce and Electronic Data Interchange user group formed to promote and support the use of EC/EDI in Arizona by sharing experiences and information.

Arizona Health and Information Network (AZ-HIN)

(Arizona Health Sciences Center, University of Arizona, Tucson AZ 85724, (520)626-7343, fax (520)626-2145) Arizona Health and Information Network (AZ-HIN) is a non-profit consortium of Arizona teaching hospitals and health science educational institutions based at the **Arizona Health Sciences Center**. AZ-HIN uses the Internet to connect hospitals, libraries, teaching and health care institutions, and to provide access to health literature databases, other information and education products.

Arizona Innovation Network (AIN)

(1435 N Hayden Rd., Scottsdale, AZ 85257-3773, (602)990-9558, fax (602)970-6335) AIN is a partnership between large, medium, and small technologically innovative businesses and professional service companies that are working together to improve the economic and regulatory environment in Arizona. They provide educational programs, and create a support network for innovative businesses.

Arizona Library Association (AzLA)

(14449 N 73rd St. , Scottsdale AZ 85260-3133, (602)998-1954, fax (602)998-7838, e-mail - meetings@enet.net) AzLA represents all types of Arizona libraries and serves to promote and improve library service and librarianship in Arizona. They are active in promoting the expansion of library services to the public via electronic access and services.

Arizona Newspaper Association (ANA)

(1101 N Central Ave., Suite 670, Phoenix AZ 85004-1947, (602)261-7655, fax (602)261-7525, URL - http://www.infop.com/ana/index.html) The ANA is a non-profit trade association representing daily (25), weekly (52) and (bi-)monthly (9) Arizona newspapers and publications. They offer an advertising promotion and placement service, a press release service and a press clipping bureau.

Arizona Online Users Group (AOLUG)

(c/o Mark Goldstein, International Research Center, PO Box 825, Tempe, AZ 85280-0825, voice & fax (602)470-0389, e-mail - markg@xroads.com) AOLUG supports online researchers and professional users of databases with periodic educational meetings and workshops.

Arizona Procurement Technical Assistance Network (APTAN)

(1435 N Hayden Rd., Scottsdale, AZ 85257-3773, (602)945-5452, fax (602)970-6355, Ventech modem - (602)945-4106 & (800)711-0502) APTAN offers **Ventech** (formerly **Arizona Automated Vendor Inquiry System - AAVIS-II)**, a free, publicly accessible, electronic database of business profiles and thousands of Arizona companies to assist agencies, contractors and businesses in locating Arizona vendors of products and services. APTAN's **Bid Source** provides targeted information on pending federal and local government contracts to subscribers and researches technology transfer opportunities.

Arizona Science Center

(147 E Adams St., Phoenix, AZ 85004-2394, (602)258-7250, fax (602)256-0033, URL - http://aztec.asu.edu/government/Tempe/asc/asc.html) The Arizona Science Center is an interactive science facility based on the "learn-by-doing" approach. The Center contains hands-on exhibits, offers live science demonstrations, and hosts special events and activities. The Center's newest exhibit is "Computer Works." Construction of a new 120,000 square-foot facility is underway with a planetarium & large-screen theater.

Arizona Software Association (ASA)

(3900 E Camelback Rd., Suite 200, Phoenix, AZ 85018, (602)912-5351, fax (602)957-4828, URL - http://www.azsoft.com/) The ASA is one of the Governor's Strategic Partnership for Economic Development (GSPED) industry clusters representing an active Arizona software development and marketing industry. They hold a wide range of seminars, conferences and dinner meetings.

Arizona State Public Information Network (ASPIN)

(Central AZ (602)965-7000, Northern AZ (520)523-6508, Southern AZ (520)626-4642, e-mail - Nic-q@asu.edu, URL - http://aspin.asu.edu/) Arizona State Public Information Network (ASPIN), based at ASU, assists Arizona's public organizations and communities in connecting to the Internet. They've connected the three primary urban areas of Flagstaff, Phoenix, and Tucson with a state-wide backbone and within these urban areas they have provided connections to many organizations (over 50 in Phoenix). They then extended the backbone out to the state's eight rural community colleges and from their into their communities and have proposed to connect Arizona's K-12 schools to the backbone developing a robust educational network. ASPIN also staffs and supports three state-wide **Network Information Centers (NICs)** providing a one-stop ready reference point and help desk for Internet users.

Arizona Technology Access Program (AzTAP)

(2600 N Wyatt Dr., Tucson AZ 85712, (520)324-3170, fax (520)324-3176). The mission of the AzTAP is to increase access to assistive technology (AT) devices and services for individuals with disabilities and their families. Program staff work with consumers, service providers, state agencies, private industry, legislators and other interested individuals to facilitate the development of a statewide system to provide AT services. Though they don't currently host an Internet presence, online information is available from the **Disabilities Help Line of Arizona** at **Community Information and Referral Services** ((602)263-8856, (800)352-3792, e-mail - disabilities@cirs.org, URL - http://sunrise.cirs.org/disabilities.html).

Arizona Technology Incubator (ATI)

(1435 N Hayden Rd., Scottsdale, AZ 85257-3773, (602)990-0400, fax (602)970-6355) ATI is affiliated with Arizona State University and has 14 high-technology firms currently in an incubator program to aid their development and growth. They also work to transfer technology from the university and government sources to the private sector for licensing and commercialization.

Arizona Telecommunications and Information Council (ATIC)

(PO Box 1119, Tempe, AZ 85280-1119, (602)254-5887, e-mail - atic@rtd.com) ATIC is an economic development foundation under the Governor's Strategic Partnership for Economic Development (GSPED). Their mission is to drive implementation of an information applications and telecommunications infrastructure that will support economic growth in Arizona. ATIC provides a forum for telecom issues, education and advocacy involving a diverse range of public and private partners.

Arizona Telecommunications Community (AzTeC) Computing

(c/o Telecomm. Services, Box 870201, Arizona State University, Tempe, AZ 85287-0201, (602)965-4156, 2400 baud modem (602)965-4151, >=9600 baud modem (602)965-6699, URL - http://aztec.asu.edu/) AzTeC is an Free-Net affiliated with the **National Public Telecomputing Network (NPTN)** and provide noncommercial access to the Internet. AzTeC serves up a variety of local information (including municipal background, news and events) and provides e-mail accounts and limited Internet access for approximately 12,000 Phoenix area residents (currently only local dial-in phone lines are provided but in southern Arizona, access through **CACTI-NET,** see entry below). They are linked to many other nationwide and worldwide community-based Free-Nets and are working to site public access terminals in convenient locations throughout the community (10 in place so far).

Arizona Telecommuting Advisory Council (AzTAC)

(AZ Dept. of Admin. Travel Reduction Programs, 1700 W Washington, Room B-52, Phoenix, AZ 85007, (602)804-9099, fax (602)542-3636, information hot-line (602)504-1100) AzTAC is a statewide telecommuting advocacy group and information resource center, dedicated to making telecommuting a recognized alternative to travel for a broad range of needs. The national **Telecommuting Advisory Council (TAC)** with articles and telecommuting links is at URL - http://www.telecommute.org/ .

Community And City of Tucson Information NETwork (CACTI-NET)

(formerly **METCOM**) (John D'Andrea, City of Tucson Office of Economic Development, PO Box 27210, Tucson, AZ 85726-7210, (520)791-5093, fax (520)791-5413, modem (520)621-9600, URL - gopher://econ.tucson,az.us/) CACTI-NET allows Tucson citizens, businesspersons and those outside the area to access a broad spectrum of regional government, health, business and educational information as well as reach out to the Internet as the southern Arizona gateway to the **AzTeC Free-Net**.

Communications Workers of America (CWA)

(9224 N 5th St., Phoenix, AZ 85020, (602)331-7019, fax (602)861-4171) The CWA is a trade union which represents workers in several different fields. With the bulk of their members in the traditional telephone companies, they also represent workers in the printing industry, Maricopa Community College District, and Labor's Community Service Agency. There are 7 CWA Locals in Arizona, with the largest being Phoenix Local 7019 with 5,600 unionized workers.

Community Information and Telecommunications Alliance - Tucson Link

(4500 E Sunrise Dr., Suite Q-2, Tucson, AZ 85718, voice & fax (520)299-1486, e-mail - steven.peters@internetMCI.com, URL - http://tucsonlink.rtd.com/) Through public meetings, electronic communication and Action Teams, the Community Information and Telecommunications Alliance's Tucson Link supports the development and deployment of Tucson's information and telecommunications infrastructure. This information technology infrastructure of connectivity, public policy, applications and support will enable continued educational advancement, an enhanced quality of life and economic prosperity for Tucson's citizens.

Datalink Project

(URL - http://www.halycon.com/pickard/CANAMEX/) Datalink has been funded by the Arizona Legislature for study and pilot trials the last two years. It will facilitate trade within the Pacific NorthWest Economic Region (PNWER) and throughout the NAFTA (CANAMEX) trade corridor via the discovery, cataloging and routing of trade related information such as trade leads and access to databases about companies, government agencies, and industry focused associations. A pilot World Wide Web site is in operation with an abundance of trade links, but decisions on further development are pending.

Economic Development Information Centers (EDIC)

(Library Extension Division, 1700 W Washington, Suite 241, Phoenix, AZ 85007, (602)542-5841, fax (602)256-6372) Located throughout Arizona, 28 public and community college libraries have established Economic Development Information Centers to support their local business communities and provide the information local businesses and economic development practitioners need. A core collection of business reference materials and a staff person familiar with business resources, the local economy and community are available. The EDIC staff also provide referrals to other business information specialists and support organizations, as well as performing database searching and utilizing Internet access to meet the business patron's needs. Seed money came from the Federal Library Services and Construction Act while ongoing funding comes from local support and federal grants.

Electronic Commerce Net (ECNet)

(URL - http://www.phx.cox.com/ecnet/ecnet.htm) ECNet has been one of the first broadband metropolitan area networks (MAN) to be implemented in the cable industry. A joint pilot project of Cox Communications, Digital Equipment Corporation and Arizona State University, ECNet has connected Phoenix manufacturing companies to support collaborative engineering, improve productivity, enhance product quality and reduce time to market for new products. Utilizing the existing hybrid fiber/ coax cable network to achieve 10 Mbps Ethernet connectivity, ECNet can evolve to serve concurrent CAD, videoconferencing, multimedia warehousing, telecommuting and high-speed Internet access needs.

Information Technology and Telecommunications Association (TCA) - AZ Chapter

(PO Box 33545, Phoenix, AZ 85067-3545, (602) 207-4808, fax (602) 207-4888) TCA represents the interests of end users of information technologies such as voice, data, video and image. TCA is an industry resource for regulatory issues, peer-to-peer networking and education.

International Organization of Women in Telecommunications (IOWIT) - AZ Chapter

(c/o Susan Johnson, (602)506-1106, e-mail - sjohnson@tcom.maricopa.gov) IOWIT works to promote and enhance the image of women professionals in the telecommunications industry and business community.

Joint Interoperability Test Command (JITC) at Fort Huachuca

(Fort Huachuca, AZ 85613-7020, (520)538-5482, (800)538-5482, URL - http://jitc-emh.army.mil/) The JITC is the Department of Defense's newest, most modern facility for testing information, communication and intelligence systems. Its staff of more than 300 conduct a wide range of developmental, operational and standards conformance tests for private industry, the Department of Defense, our allies, and several federal agencies.

National Law Center for Inter-American Free Trade

(111 S Church Ave., Suite 200, Tucson, AZ 85701-1602, (520)622-1200, fax (520)622-0957, e-mail - natlaw@ccit.arizona.edu, URL - http://www.natlaw.com/) The National Law Center's vision and purpose is to facilitate trade and investment in the Western Hemisphere by standardizing key trade and investment documents and harmonizing trade and investment law. Their **InterAM** database (available to subscribers) is one of the most unique and comprehensive collections of Mexican legal materials.

NicheNet

(c/o Don Reck, Scottsdale Chamber of Commerce, (602)949-2167, fax (602)947-4523, e-mail - 76632.1441@compuserv.com) NicheNet is a small business interactive communications network, creating customer-specific marketing applications and business productivity tools for metropolitan area networks and the Internet. NicheNet also supplies computer and telecommunications assistance.

Northern Arizona University Network (NAUNet)

(Statewide Coordinator (520)523-6608) NAUNet is an instructional interactive television (distance learning) system encompassing over 20 independent sites throughout Arizona with an extensive microwave network. NAUnet's classrooms are on the campuses of NAU, ten community colleges, and five rural school districts. The **NAU Learning Alliance (nauLA)** is a network of more than 100 satellite downlink sites across Arizona that participate in NAU satellite programs. Also joining with Missouri, Oklahoma and Washington leaders in satellite education, NAU has formed **IdeaNet** to connect 2,000 schools in 33 states to an interactive television and computer network, as well as provide a wide range of programming.

Residential Utility Consumer Office (RUCO)

(15 S 15th Ave., Suite 104, Phoenix, AZ 85007, (602)542-3733, fax (602)542-3738) RUCO was formed to represent the interests of residential utility consumers in rate-related proceedings before the ACC.

Society for Technical Communications (STC) - Phoenix Chapter

(PO Box 67214, Phoenix, AZ 85082-7214, (602)553-4321) STC is a professional organization devoted to the advancement of the theory and practice of technical communications.

Teleservices Industry Group (TIG)

(c/o Greater Tucson Economic Council, 33 N. Stone St., Tucson, AZ 85701, Fred Gould - (520)544-9733, URL - http://www.futurewest.com/gtec/tele.htm) TIG is a Tucson-based telephone call center trade association consisting of 19 firms representing more than 5,000 jobs and $225 million in combined sales.

Federal Government - Telecommunication Resources:

General Federal Access Points:

CapWeb

(URL - http://policy.net/capweb/congress.html) A part of **Policy Net** offering an extensive and well organized directory to Capitol Hill with emphasis on legislative activity and contacts but also information on the Executive and Judiciary branches. **Campaign '96** and the **Political Page** link to political activity.

Federal Web Locator

(URL - http://www.law.vill.edu/Fed-Agency/fedwebloc.html) The Federal Web Locator is provided by **Villanova Center for Information Law and Policy** and intended to be the one stop shopping point for federal government information on the World Wide Web.

FedWorld Information Network

(URL - http://www.fedworld.gov/) The U.S. government's own primary entry point to Federal resources available on the Internet as provided by NTIS.

Federal Branches, Departments and Agencies:

Congress (THOMAS)

The THOMAS Legislative Information system provided by the Library of Congress is the primary access to Federal legislative resources available at: URL - http://thomas.loc.gov/

U.S. House of Representatives operator (202)225-3121, URL - http://www.house.gov/
U.S. Senate operator (202)224-3121, URL - http://www.senate.gov/
Office of Technology Assessment (OTA - closed 10/1/95) URL - http://www.ota.gov/
OTA Sustaining Site (at Idaho State University) URL - http://bilbo.isu.edu/ota/ota.html
(**LEGI-SLATE** URL - http://gopher.legislate.com/, **C-SPAN** URL - http://www.c-span.org/)

Department of Agriculture (USDA)

(URL - http:www.usda.gov/) For telecommunications and Universal Service issues in relation to rural development and Federal loan and grant support, see the **Rural Economic & Community Development** agency (URL - http://www.rurdev.usda.gov/recdhome.html) and its **Rural Utility Services (RUS)** program (URL - http://www.rurdev.usda.gov/agency/rus/html/rus_home.html).

Department of Commerce (DOC)

(URL - http://www.doc.gov/) The responsibilities of DOC include expanding U.S. exports, developing innovative technologies, gathering and disseminating statistical data, measuring economic growth, granting patents, promoting minority entrepreneurship, predicting the weather and monitoring stewardship. A list of DOC agencies are on the Internet (URL - http://www.doc.gov/resources/doc.agencies.html) or you can use the **Commerce Information Locator Service (CILS)** (URL - http://www.doc.gov/inquery/cils.html).

The **National Telecommunications and Information Administration (NTIA)** (URL - http://www.ntia.doc.gov/) The NTIA is a primary driving force in the Federal efforts at defining and implementing a National Information Infrastructure (NII) to conduct commerce, educate, entertain and inform citizens. NTIA runs the **Telecommunications and Information Infrastructure Assistance Program (TIIAP)** providing assistance grants ($35.7 million matched by $60 million in non-Federal funds) for 117 demonstration and planning projects in 47 states and DC for 1995. The NTIA is very active on the Universal Service issue holding field hearings and publishing numerous white papers which are available on their Internet site. The NTIA has a research and engineering branch, the **Institute for Telecom Sciences (ITS)** at URL - http://www.its.bldrdoc.gov/ . Links to other telecommunication and information sources are also provided (URL - http://www.ntia.doc.gov/infsites.html).

The **National Institute of Standards and Technology (NIST)** (URL - http://www.nist.gov/) sponsors research and technology transfer related to the technological foundation of the National Information Infrastructure (NII) in areas such as computing, telecommunications, networking equipment, standards, and applications necessary to change the way people gather, process and share information. Access to NIST's **Advanced Technology Program (ATP)** (URL - http://www.atp.nist.gov/) is also available.

The DOC's **Office of Technology Policy (OTP)** runs the **Partnerships for a Competitive Economy (PACE)** (URL - http://www.doc.gov/pace/pacepge.html) helps American businesses to integrate technological innovation and advocate policy reform to promote competition in the global economy.

Other Department of Commerce (DOC) Internet sites of interest include:

Bureau of the Census	http://www.census.gov/
International Trade Administration (ITA)	http://www.itaiep.doc.gov/eebic/cduga.html
Patent and Trademark Office	http://www.uspto.gov/
Stat-USA (business and economic information)	http://www.stat-usa.gov/
National Trade Data Bank (NTDB)	http://www.stat-usa.gov/BEN/Services/ntdbhome.html
National Economic, Social and Environmental Data Bank (NESE)	http://www.stat-usa.gov/BEN/Services/nesehome.html
Economic Bulletin Board/Lite Edition (EBB/LE)	http://www.stat-usa.gov/BEN/Services/ebbhome.html

Department of Defense (DOD)

The DOD's **Advanced Research Project Agency (ARPA)** (URL - http://www.arpa.mil/) is the central research and development organization for the DOD. It manages and directs selected basic and applied research and development projects for the DOD, and pursues research and technology where risk and payoff are both very high and where success may provide dramatic advances for traditional military roles and missions and dual-use applications. The DOD's **DefenseLINK** (URL - http://www.dtic.dla.mil/defenselink/) and **Defense Technical Information Web** (URL - http://www.dtic.dla.mil/dtiw/) provide access to a range of defense related technology information. **Defense TechTRANSIT** (http://www.dtic.dla.mil/techtransit/) supports technology transfer and dual use.

Department of Education (DOE)

(URL - http://www.ed.gov/) The mission of DOE is to strengthen the Federal commitment to assuring access to equal educational opportunity for every individual, as well as to supplement and complement the efforts of states, the local school systems and others, and improve the coordination, management and accountability of Federal education programs. They provide an abundance of programs and resources of interest to the educational community including grants promoting the NII in education, distance learning and the connection of educational institutions. DOE's **National Institute on Disability and Rehabilitation Research (NIDRR)** (URL - http://www.ed.gov/offices/) has programs and resources for disability rehabilitation and assistive technology (AT).

Department of Health and Human Services (DHHS)

(URL - http://www.os.dhhs.gov/) DHHS's **Community Services Network** is a prototype of a state-of-the-art computer and telecommunication system under development and evaluation to assess its viability to support the decentralization and coordination of health and human services for at-risk individuals. The **Social Security Administration (SSA)** is deploying kiosks to disseminate information and provide service and pursuing electronic benefits transfer (EBT) along with other DHHS agencies. The **National Library of Medicine (NLM)** (URL - http://www.nlm.nih.gov/) has long provided online medical databases (i.e., **MEDLINE**) and is now developing advanced health care applications such as rural telemedicine, teleradiology, computerized prescriptions and patient records, and linking health care facilities.

Federal Communications Commission (FCC)

(consumer assistance (202)418-0200, Infoline fax-on-demand (202)418-2830, URL - http://www.fcc.gov/) The FCC is an independent regulatory commission created by Congress with primary responsibility for authorizing and regulating interstate communications services including the allocation of radio spectrum. Although its actions are independent of the Executive Branch, its decisions and other activities have been consistent with the Administration's NII goals. The FCC has been the primary force in the definition and evolution of Universal Service as detailed in the body of this report.

The **Common Carrier Bureau (CCB)** ((202)418-1500, URL - http://www.fcc.gov/ccb.html) regulates interstate wireline 'common carrier' services such as telephone and telegraph companies. The objective of regulation is to provide customers with rapid, efficient, nationwide and worldwide services at reasonable rates. The CCB's **Industry Analysis Division** (202)418-0940 conducts economic, financial and statistical analysis of the common carrier telecommunications industry. Some of their data and reports can be accessed through the Internet WWW or the Infoline fax-on-demand service, but the majority are only available in hardcopy or on **FCC-State Link** (modem (202)418-0241 and FedWorld telnet).

The **Cable Services Bureau (CSB)** (URL - http://www.fcc.gov/csb.html) studies and regulates the cable television industry. The **Mass Media Bureau (MMB)** (URL - http://www.fcc.gov/mmb.html) regulates television and radio stations and issues broadcast licenses specifying the community, channel and operating power of the station. The **Wireless Telecommunications Bureau (WTB)** (URL - http://www.fcc.gov/wtb.html) handles all domestic wireless telecommunications programs and policies, except satellite communications.

High-Performance Computing and Communications (HPCC) Program

(URL - http://www.hpcc.gov/) The HPCC Program seeks to extend U.S. technological leadership in high performance computing and computer communications by cooperation between government, industry, and universities. They support R&D leading to technology transfer and expect to spur gains in productivity and industrial competitiveness by integrating these technologies into the design and production process.

Information Infrastructure Task Force (IITF)

(URL - http://iitf.doc.gov) The IITF was formed to articulate and implement the Administration's vision for the NII. The IITF includes high-level representatives of the Federal agencies that play a major role in the development and application of information and telecommunications technologies and is chaired by Secretary of Commerce Ronald H. Brown. IITF's **Information Policy Committee (IPC)** (URL - gopher://ntiant1.ntia.doc.gov:70/11s/iitf/infopol) identifies and suggests critical information policy that must be addressed if the National Information Infrastructure is to be fully deployed and utilized. Its working groups include Intellectual Property, Privacy, and Government Information. IITF's **Telecommunications Policy Committee (TPC)** (URL - gopher://ntiant1.ntia.doc.gov:70/11s/iitf/telecom) formulates a consistent Administration position on key telecommunications issues taking into account the current technological, marketplace, and regulatory policy developments. TPC's working groups include Universal Service, Network Reliability and Vulnerability, International Telecommunications, Legislative Drafting, and NII Securities Issues. IITF's **Committee on Applications and Technology (CAT)** (URL - gopher://ntiant1.ntia.doc.gov:70/11s/iitf/appstech) coordinates the Administration's efforts to develop, demonstrate and promote applications of the NII and to develop and recommend technology strategy and policy to accelerate its implementation. CAT's working groups include Technology Policy, Government Information Technology, and Health Information and Applications. The **NII Virtual Library** (URL - http://nii.nist.gov/nii.html) provides Internet access to background, publications and resources support the vision and activities of the IITF and Federal NII development. Information about the **NII Advisory Council (NIIAC)** (URL - http://iitf.doc.gov/AdCoun.html) is also available.

Library of Congress (LOC)

(URL - http://www.loc.gov/) The Library of Congress is using the World Wide Web (WWW) to present information about and materials from its collections over the Internet. One can not only search the LC Online Systems for library holdings but view items from digitized historical collections and exhibits. The LOC developed and maintains **THOMAS** (URL - http://thomas.loc.gov/) and provides a subject oriented index of Web sites, their **Global Electronic Library** (URL - http://lcweb.loc.gov/global/globalhp.html).

National Academy of Sciences (NAS)

(URL - http://www.nas.edu/) The NAS was created in 1863 to provide independent, objective scientific advise to the nation and includes the **National Academy of Engineering (NAE)**, the **Institute of Medicine (IOM)**, and the **National Research Council (NRC)**. They have a wide range of science and research publications available online including several important to the NII policy process.

National Aeronautics and Space Administration (NASA)

(URL - http://www.nasa.gov/) NASA has always lead in the transfer of technology and dissemination of aeronautic and space information. It has a strong Internet presence supporting scientific development and educational outreach. Access to **NASA Centers**, a gallery of resources and the **Mission to Planet Earth** is provided. NASA continues to advance space-based telecommunications with their **Advanced Communications Technology Satellite** (URL - http://kronos.lerc.nasa.gov/acts/acts.html) program.

National Science Foundation (NSF)

(URL - http://www.nsf.gov/). The NSF was established in 1950 to promote the progress of science and engineering, advance the national health prosperity, and welfare, and to secure the national defense. Their **NSFNET** fostered much of the early growth of the Internet, connecting more than 1,200 U.S. colleges and universities and facilitating the connection of over a thousand high schools, libraries, medical schools, and public health facilities. They continue to develop and promote the NII in education (Global Schoolhouse, Superquest), commercial applications, and in conjunction with ARPA and private sector collaboration, perform very high-speed communications network developing and testing.

National Technical Information Service (NTIS)

(URL - http://www.fedworld.gov/ntis/ntishome.html) NTIS is a U.S. Department of Commerce (DOC) agency, but since it operates on the revenue from the sale of information, most of their products are available from them or commercial vendors at some cost. NTIS provides most of the scientific, technical, and engineering documents (plus other topics and subjects) released by the U.S. government during the past 50 years. Some notable products are the **NTIS Bibliographic Database**, **Federal Research in Progress (FEDRIP)**, **Foreign Broadcast Information Service** and **World News Connection**.

Smithsonian Institution

(URL - http://www.si.edu/start.htm) The Smithsonian, with its dozens of museums and research centers, brings its best to the Internet as the **Electronic Smithsonian**. A content rich, exciting and informative site supporting educational, cultural, and research needs of the nation in innovative ways.

The White House - Executive Branch

(URL - http://www.whitehouse.gov/) The White House has a popular Internet site providing a view of the **Executive Branch**, the ability to explore NII and other policy issues, and the opportunity and encouragement for citizens to send feedback. Archives for the present administration are available at **Texas A&M** (URL - http://www.tamu.edu/whitehouse/). The **Office of Science and Technology Policy** (URL - http://www.whitehouse.gov/OSTP.html) provides the President with timely policy advice and advances the Administration's agenda in fundamental science, education and scientific literacy, investment in applied research, and international cooperation.

State Government - Telecommunication Resources:

Council of Governors' Policy Advisors (CGPA)

(Hall of the States, 400 N Capitol St., Suite 390, Washington, D.C. 20001-1511, (202) 624-5386, fax (202) 624-7846) Founded in 1964, the Council of Governors' Policy Advisors is a membership organization of the key policy and planning advisors to the nation's Governors. It provides a forum for chiefs of staff, policy directors, agency heads and other top policy advisors to share ideas on policy development and to debate critical issues. They offer technical assistance with the policy development process and with specific policy issues as well as a variety of publications including coverage of rural and economic development issues.

The Council of State Governments (CSG)

(3560 Iron Works Pike, PO Box 11910, Lexington, KY 40578-1910, (606)244-8000, SIC inquiries (606)244-8253, fax (606)244-8001, URL - http://www.csg.org/) The Council of State Governments champions excellence in state government, works with state leaders across the nation and through its regions to put the best ideas and solutions into practice. Their publications include an annual encyclopedia of state government, directories of state leadership by various branches and functional groupings, issue briefs and backgrounds, suggested state legislation, and regional guides. They run the **States Information Center (SIC)** and the **Center for State Trends and Innovations** providing research, resource sharing, trends, and forecasts. Their home page offers links to state, federal, and international government sites.

National Association of Regional Councils (NARC)

(1700 K Street, NW, Suite 1300, Washington, D.C. 20006, (202)457-0710, fax (202)296-9352, URL - http://narc.org/narc/index.html) NARC is a non-profit membership organization of public agencies engaged in regional planning and policy coordination for local governments in both urban and rural areas.

National Association of Regulatory Utility Commissioners (NARUC)

(1102 Interstate Commerce Commission Building, PO BOX 684, Washington D.C., 20044-0684, (202) 898-2200, fax (202)898-2213, URL - http://www.puc.state.tx.us/naruc-hp.htm) Founded in 1889, NARUC is a quasi-governmental, non-profit organization whose members include regulatory bodies of the 50 states, Washington, D.C., Puerto Rico and the Virgin Islands. They seek to improve the quality and effectiveness of public regulation in America and produce a large quantity of research reports and publications on utility issues including communications. The annual Compilation of Utility Regulatory Policy is a virtual encyclopedia of utility regulatory policy and their Universal Service Project (most recent report 7/94) actively tracks and proposes positions on Universal Service issues. Their home page offers links to state and federal regulatory agencies.

National Association of State Information Resource Executives (NASIRE)

(167 W Main St., Suite 600, Lexington KY 40507, (606) 231-1885, fax (606) 231-1928, URL - http://www.state.ky.us/nasire/NASIREmain.html) NASIRE provides a forum for senior policy-level information resource executives dealing with information technology in a government environment. Two of their five key issues are public access to government, and leveraging and developing the information infrastructure. Their publications include an annual directory, biennial state-by-state survey, issue focus reports, and state federal issues briefs. From their home page, **StateSearch** serves as a topical clearing house to state government information on the Internet (currently 1,357 entries in 22 categories).

National Association of State Telecommunications Directors (NASTD)

(3560 Iron Works Pike, PO BOX 11910, Lexington KY 40578-1910, (606)244-8187, (606) 244-8001, URL - http://www.csg.org/nastd.html) NASTD is a professional organization whose mission is to provide a forum for the sharing of information among states, develop and promote public policy for

telecommunications, and develop the telecommunications infrastructure with the overall goal of improving the operational efficiency of state government and the social and economic welfare of the nation. Their annual **State Report** compiles information on each state's telecommunications agency's statutory responsibilities, state regulatory and legislative activities, on-going and new state projects, requests for proposals, and the strategic direction of the state's telecommunications initiatives.

National Association of Telecommunications Officers and Advisors (NATOA)

(1200 19th ST NW, Suite 300, Washington, D.C. 20036, (202)429-5101, URL - http://www.natoa.org/) NATOA provides a forum for municipal, county, state and regional officials and agencies engaged in the regulation, administration, programming or planning of cable and/or telecommunications systems.

National Conference of State Legislatures (NCSL)

(444 N Capitol St. NW, Suite 515, Washington, D.C. 20001, (202)624-5400, fax (202) 737-1069, URL - http://www.ncsl.org/) The NCSL was founded in 1975 as a bipartisan organization dedicated to serving the lawmakers and staffs of the nation's 50 states, its commonwealths and territories and providing a voice for state interests before Congress, the administration and federal agencies. They are a source for research, publications, consulting services, meetings and seminars.

National Governors' Association (NGA)

(Hall of the States, 444 N Capitol St., Suite 267, Washington D.C. 20001-1572, (202)624-5392, fax (202)624-5313, e-mail - jaykayne@mnsinc.com) The NGA deals collectively with issues of public policy and governance. Their ongoing mission is to support the work of the Governors by providing a bipartisan forum to help shape and implement national policy and to solve state problems. The NGA **Center for Policy Research** has five divisions including the Economic Development and Commerce Policy Studies Division which covers telecommunications issues. Their publication "Telecommunications: The Next American Revolution" (1994) is of particular interest. An Internet site is under development, but their working group, **Science and Technology Council of the States (STCS)** is at URL - http://www.csn.net/~pvb/stcs.html .

The National Regulatory Research Institute (NRRI)

(1080 Carmack Rd, Columbus, OH 43220, (614)292-9404, fax (614)292-7196, URL - http://www.eng.ohio-state.edu/nrri.html) The NRRI was established by NARUC in 1976 at Ohio State University and provides a variety of in-depth research reports on utility regulatory issues including dozens on telecommunications regulation. Their publication "Universal Service in the US: Dimensions of the Debate" (1994) is an excellent overview and analysis of state policy issues.

The State Networking Project

((512)471-3241, fax (512)471-1582, URL - http://www.tenet.edu/snp/main.html) The State Networking Project is a nationwide collaborative effort on long-range planning for the integration of an information infrastructure to support the needs of the K-12 educational community. Their WWW site offers individual state surveys of K-12 network activity and a summary report "Networks for Goals 2000 Reform."

Western Governors' Association (WGA)

(600 17th St., Suite 1705 South Tower, Denver, CO 80202-5452, (303)623-9378, fax (303)534-7309, URL - http://www.concerto.com/smart/) WGA is an independent, non-partisan organization of Governors from 18 western states, two Pacific territories and one commonwealth. They were formed in 1984 to provide strong leadership in an era of critical change in the economy and demography of the West by developing regional policy, conducting research and publishing their findings and analysis. Their **SmartStates** initiative is exploring regionally networked government services, a **Virtual University**, Electronic Benefits Transfer (EBT), and rural health initiatives including telemedicine.

Telecommunication Industry Trade Associations:

Alliance for Competitive Communications (ACC)

(1133 21st St. NW Suite 700, Washington, D.C. 20036, (202)973-5300, URL - http://bell.com/) The ACC is coordinating the seven Bell telephone companies' effort to open communications markets and seeks to build coalitions with others who share the goal of fostering competition among local telephone companies, long distance carriers and cable television concerns. Their Internet site has background and timely updates on Congressional telecommunications reform activities and links to their RBOC members and other telecommunications policy issue sites. For an often opposing view of telecommunications reform, see the **Competitive Long Distance (CLD) Coalition** (URL - http://www.cldc.com/) consisting of ACTA, AT&T, CompTel, LDDS WorldCom, MCI, Sprint and TRA.

Cellular Telecommunications Industry Association (CTIA)

(1250 Connecticut Ave. NW Suite 200, Washington D.C., 20036, (202)785-0081, fax (202)785-0721, URL - http://www.wireless-apps.com/ctia/index.html) CTIA represents all wireless technologies, promoting legislative, regulatory and judicial decisions that further the success and availability of wireless telecommunications, and providing information on the latest technical & public policy developments in the wireless industry. They publish periodic Wireless SourceBook, FactBook, MarketBook, and MemberBook, as well as other resource materials. Some background, data and industry updates are available from their fax-on-demand service at (202)736-3250.

Commercial Internet eXchange (CIX) Association

(PO BOX 1451, Sterling, VA 20167-9998, (703)824-9249, URL - http://www.cix.org/) The CIX Association is a non-profit trade association of Public Data Internetwork service providers promoting and encouraging development of the public data communications internetworking services industry in both national and international markets. CIX provides for interconnection of all members for unrestricted data traffic without charges. Their Internet site carries policy white papers, regulatory and legislative information relevant to **Internet Service Providers (ISPs)**.

International Communications Industry Association (ICIA)

(3150 Spring Street, Fairfax VA, 22031-2399, (703)273-7200, fax (703)278-8082, URL - http://www.usa.net/icia/) ICIA represents for-profit organizations and individuals who are involved in commercializing or utilizing communications technologies including more than 1500 members selling video, audio-visual and computer products and services to business and industry, government, education and health markets. Their Internet site carries content from **Communications Industries Report (CIR)**.

International Telecommunications Union (ITU - CCITT)

(Information Services Dept., Place des Nations, 1211 Geneva 20, Switzerland, (+41 22) 730-6666, URL - http://www.itu.ch/) The ITU is an international organization within which governments and the private sector coordinate global telecom networks and services. ITU activities include the coordination, development, regulation and standardization of telecommunications and the organization of regional and world telecom events. Their Internet site provides extensive links to related WWW sites

International Television Association (ITVA)

(6311 N. O'Connor Rd., Suite 230, Irving, TX 75039, (214)869-1112, fax (214)869-2980, URL - http://www.itva.org/) ITVA is devoted to providing accomplished visual communicators with professional and business development opportunities promotes the growth, quality and success of film, video and multimedia communications and related businesses. Their Internet site provides links to video and multimedia resources and a **Green Pages** (Professional Services Directory) of members.

MultiMedia Telecomm Association (MMTA)

(formerly **North American Telecommunications Association - NATA**) (2000 M St., NW, Suite 550, Washington D.C. 20036-3367, (800)538-6282, (202)296-9800, fax (202)296-4993, URL - http://www.mmta.org/) MMTA is a member-led organization of five technology-specific divisions: Voice/Multimedia, Computer-Telephone Integration, LAN/WAN Internetworking, Wireless Communications, and Collaboration/Conferencing/ Messaging. MMTA was formed to respond to changes within the telecommunications industry associated with the convergence of multiple technologies including voice, data, video and networking. Their publications include the biweekly Washington Update on public policy trends, an annual Telecommunications Market Review & Forecast, an Industry Source Book and a Directory of Telecommunications Schools and Institutions.

National Association of Broadcasters (NAB)

(1711 N. Street NW, Washington, D.C. 20036-2891, (202) 429-5300, URL - http://www.nab.org/) NAB seeks to ensure the viability and strength of America's free, over-the-air radio and television broadcasters and serve as a practical, technical and educational resource for the entire industry. NAB believes the American public is best served by a broadcasting system that provides programming free of government intervention and reflecting local interest and audience choice. Their Internet site provides research and information briefs, an online newsletter and a **Library & Information Center** including links to related sites.

National Cable Television Association (NCTA)

(1724 Massachusetts Ave., NW, Washington, D.C. 20036-1969, (202) 775-3550, fax (202) 775-3675) NCTA's mission is to advance the cable television industry's public policy interests before Congress, the executive branch, the courts and the American public; and to promote the industry's operating, programming and technological developments. Their publications include The Cable Television Handbook, Cable Television Developments (3 times a year), Linking Up (bimonthly newsletter on community and public relations projects), and Programmers' Sourcebook: A Guide to Program Buyers.

National Exchange Carriers Association (NECA)

(100 S. Jefferson Rd., Whippany, NJ 07981, (201)884-8000, fax (201)884-8469) NECA was formed in 1983 at the direction of the FCC as a membership association of local telephone companies. They are a leading integrating force for the maintenance and evolution of Universal Service in that they administer the national **Universal Service Fund** and **Lifeline Assistance** programs as well as providing tariff and revenue distribution services to exchange carriers. NECA also administers the **Telecommunications Relay Services** fund and the Vermont Universal Service Fund. They periodically perform a comprehensive survey the telecommunications infrastructure in rural America (most recently in 1993).

National Rural Telecom Association (NRTA)

(1455 Pennsylvania Ave., NW, Suite 1200, Washington, D.C. 20004, (202)628-0210, fax (202)628-2482) The primary objective of the NRTA is to preserve the role of the Rural Electrification Administration in providing a vital program of universal and affordable telephone service to rural America.

National Telephone Cooperative Association (NTCA)

(2626 Pennsylvania Ave., NW, Washington, D.C. 20037-1695, (202)298-2300, fax (202)298-2320, URL - http://www.ltm.com/NTCA/NTCA.html) The NTCA is a nonprofit association representing nearly 500 small and rural telephone cooperatives and commercial companies. NTCA offers a highly effective government affairs program, expert legal and industry representation, educational services, regular and special publications and national and regional meetings. Their **Foundation for Rural Service (FRS)** acts to inform and educate the public on the rural telecommunications industry and to improve the quality of life throughout rural America.

Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO)

(21 Dupont Circle, NW, Suite 700, Washington, D.C. 20036, (202)659-5990, fax (202)659-4619, URL - http://www.assocdata.com/opastco/opastco.html) OPASTCO is a national organization whose local exchange carrier (LEC) members serve telephone subscribers in rural America. Their "Keeping Rural America Connected: Costs and Rates in the Competitive Era" is a superb reference and resource on rural telecommunications issues. OPASTCO's 33rd Annual Winter Convention will be held in Phoenix, Arizona on January 13-17, 1996.

(Information Technology and) Telecommunications Association (TCA)

(701 North Haven Ave., Suite 200, Ontario, CA 91764-4925, (909)945-1122, fax (909)483-3888, URL -http://www.dfrontiers.com/tca/) TCA provides a forum to support and encourage dialogue among telecommunications users and within the information technology industry, to improve quality and achieve cost-effective communications solutions, to educate member representatives, and to lead the industry by establishing and maintaining liaisons with regulatory agencies and industry partners, vendors and suppliers.

United States Telephone Association (USTA)

(1401 H St. NW, Suite 600, Washington, D.C. 20005-2136, (202)326-7300, fax (202)326-7333, URL - http://www.usta.org/) USTA is a broad-based national trade association of the local exchange carrier industry with nearly 1,100 members representing over 99% of the nation's access lines. Their central purpose is to promote the general welfare of the telephone industry, to collect and disseminate information relative to the industry, and to provide a forum for the discussion and resolution of issues of mutual concern. Their publications include a bimonthly magazine Teletimes, Phone Facts (updated annually) as well as Statistics of LECs.

Western Alliance

Rocky Mountain Telecommunications Association (RTMA) (PO Box 2746, Pinetop, AZ 85935, (520)367-0300, fax (520)367-2233) and **Western Rural Telephone Association (WRTA)** (PO Box 841, Santa Rosa, CA 95402, (707)538-7755, fax (707)538-0844) The Western Alliance is a coalition of RMTA (representing 7 western states) and WRTA which represents primarily small, rural local exchange carriers, often borrowers from the Rural Electrification Administration, serving customers in the 23 states west of the Mississippi and Pacific territories.

Associations, Foundations and Interest Groups:

Alliance for Public Technology

(PO BOX 28578, Washington, D.C. 20005-2301, (202)498-1403, fax (202)408-1134, URL - http://server.idi.net/apt/) APT is a Washington, D.C. based nonprofit, "grassroots" coalition of public interest groups and individuals whose goal is to foster broad access to affordable, usable information and communication services and technology. Their Internet site provides background and positions on Universal Service, telecommunications reform, telemedicine, privacy and other areas of policy interest.

American Communications Association (ACA)

(URL - http://www.uark.edu/depts/comminfo/www/ACA.html) The ACA, based at the University of Arkansas, is the national professional organization of scholars, students, and practitioners in the field of communication studies. Their Internet site provides a collection of materials on communication law and First Amendment issues, resources for teaching and research in communications studies, and an extensive reference resource page for scholars and activists.

American Library Association (ALA)

(50 E. Huron St., Chicago IL 60611, (800)545-2433, (312)944-6780, fax (312)944-8520, URL - http://www.ala.org/) The ALA represents all types of libraries - public, school, academic, state and special. The ALA has recently embarked on **ALA Goals 2000**, a new initiative that recommends the establishment of an **Office for Information Technology Policy** and the creation of an independent charitable foundation called the **Fund for America's Libraries**.

American National Standards Institute (ANSI)

(URL - http://www.ansi.org/) ANSI develops and evolves technical standards for many engineering and telecommunications technologies and applications. Its **Information Infrastructure Standards Panel (IISP)** (URL - http://www.ansi.org/iisp/iisphome.html) is developing standards requirements for advanced information applications including copyright concerns. For telecommunications standards, also see the **International Standards Organization (ISO)** (URL - http://www.iso.ch/) as well as the **Institute of Electrical and Electronic Engineers (IEEE)**, the **International Telecommunications Union (ITA - CCITT)** and the **Internet Engineering Task Force (IETF)** described elsewhere in this appendix.

American Society for Information Science (ASIS)

(8720 Georgia Ave., Suite 501, Silver Springs, MD 20910, (301)495-0900, fax (301)495-0810, URL - http://www.asis.org/home.html) ASIS is a professional society advocating the development, sharing and use of information and is involved with promoting multidisciplinary techniques and technologies in library and information science, communications, networking technology, and computer science.

The Annenberg Washington Program in Communications Policy Studies

(The Willard Office Bldg, 1455 Pennsylvania Ave. NW, Suite 200, Washington, D.C. 20004-1008, (202)393-7100, fax (202)638-2745, URL - http://www.annenberg.nwu.edu/) The Annenberg Washington Program in Communications Policy Studies of Northwestern University has supported or produced more than 145 publications and distributed more than 652,000 copies of them since its founding in 1983. Many concern the National Information Infrastructure, Universal Service and other aspects of governmental and citizenry telecommunications policy.

The Aspen Institute

(1333 New Hampshire Ave. NW, Suite 1070, Washington, D.C. 20036, (202)736-5800, fax (202)467-0790, URL - http://www.aspeninst.org/) The Aspen Institute brings enduring ideas and values to bear on issues of practical leadership in today's world. It accomplishes this through nonpartisan seminars and policy programs designed for leaders in business, government, the media, education, and the independent sector from democratic societies worldwide. Many publications of interest are available for nominal cost from their **Communications and Society Program** (and some or parts thereof available on their Internet site) such as Crossroads on the Information Highway, The Knowledge Economy: The Nature of Information in the 21st Century, and Toward an Information Bill of Rights and Responsibilities.

Association of Research Libraries (ARL)

(1527 New Hampshire Ave. NW, Washington, D.C. 20036, (202)232-2466, fax (202)462-7849, URL - http://arl.cni.org/). The mission of the ARL is to identify and influence forces affecting the future of research libraries in the process of scholarly communication. ARL programs and services promote equitable access to, and effective use of recorded knowledge in support of teaching, research, scholarship, and community service. Their publications include many task force reports and conference proceedings concerned with information policy, intellectual property and citizen access issues.

Benton Foundation's Communications Policy Project

(fax-on-demand (800)254-1671, URL - http://www.cdinet.com/Benton/) The Benton Foundation's Communications Policy Project promotes public interest values and noncommercial services for the National Information Infrastructure through research, policy analysis, print, video, and online publishing, and outreach to non-profits and foundations. Their Internet site provides detailed analysis and timely updates on pending Federal telecommunications legislation and regulation, links to other telecommunications resources (**Cyber Pages**), and the full version of many bulletins, briefings and working papers including many on Universal Service as well as telecommunications and democracy (see Appendix A - Bibliography for details).

Carnegie Mellon University (CMU)

(CMU URL - http://www.cmu.edu/, NetBill Project URL - http://www.ini.cmu.edu/netbill/) CMU's **Information Networking Institute** has a project **NetBill** which offers an electronic payment scheme for buying goods and services over the Internet. The transaction protocol is especially designed to handle low cost items (i.e., journal articles at 10 cents a page) which will enable new kinds of electronic commerce.

The Cato Institute

(1000 Massachusetts Ave., NW, Washington, D.C. 200001-5403, (202)842-0200, fax (202)842-3490, URL - http://www.cato.org/) The Cato Institute is a nonpartisan public policy research foundation founded in 1977. They have an extensive publication program on a broad spectrum of policy issues and make a good cross-section available on their Internet site as well as links to other public policy resources.

CAUSE - Association for Managing and Using Information Resources in Higher Education

(4840 Pearl East Circle, Suite 302E, Boulder, CO 80301, (303)449-4430, fax (303)440-0461, URL - http://cause-www.colorado.edu/) CAUSE's mission is to enable the transformational changes occurring in higher education through the effective management and use of information resources.

The Center for Advanced Study in Telecommunications (CAST)

(3016 Derby Hall, 154 S Oval Mall, Columbus, OH 43210-1339, (614)292-8444, URL - http://express.sbs.ohio-state.edu/cast/) CAST (at Ohio State University) facilitates the processing and transformation of information and people with interests in telecommunication by providing a clearing house for researchers, government agencies and telecommunications businesses and by acting as a "level playing field" for discussion of telecommunications issues. Their research areas include distance education, telemedicine, and telecommunications and economic development. A series of occasional papers on telecommunications, CAST Working Files, are available on their Internet site.

The Center for Civic Networking (CCN)

(PO Box 65272, Washington, D.C. 20035, (202)362-3831, URL - http://www.civic.net:2401/ccn.html) The CCN is a non-profit organization dedicated to applying information infrastructure to the broad public good - such as improving delivery of service by local governments, improving access to information that people need in order to function as informed citizens, and providing "electronic town halls" to broaden citizen participation in governance. Their Internet site provides policy statements and analyses, reviews and portions of books, as well as links to a variety of civic networking and telecommunication resources.

The Center for Democracy and Technology (CDT)

(1634 Eye Street NW, Washington, D.C. 20006, (202)637-9800, fax (202)637-0968, URL - http://www.cdt.org/) The Center For Democracy and Technology is a non-profit public interest organization whose mission is to develop and advocate public policies that advance constitutional civil liberties, privacy and democratic values in new computer and communications technologies.

Center for Media Education (CME)

(URL-http://www.access.digex.net/~cme/) CME is a non-profit public interest group focused on communications policy issues to promote the democratic potential of electronic media.

Center for the New West

(600 World Trade Center, 1625 Broadway, Denver, CO 80202, (303)572-5400, URL-http://www.commerce.com/cnw/) (Phoenix Office: 7319 N 16th St. Suite 100, Phoenix AZ 85020, (602)861-0533) The Center for the New West is an independent, nonprofit and nonpartisan institution for policy research, emphasizing trade, technology and economic development issues. The Center's current programs include the **Institute for Information Law and Policy** exploring how the NII can create new jobs and help US companies compete and providing management support and policy development to the **National Information Infrastructure Testbed (NIIT)** - see entry below, the **Institute for Telework**, the **Institute for Telemedicine**, and the **Institute for the New American Workforce**.

Centre for Policy Research on Science and Technology (CPROST)

(URL - http://edie.cprost.sfu.ca/) CPROST at Simon Fraser University (Canada) researches the relationship between public policy, the management of technology and innovation. They focus on small, medium and large enterprises in the global economy investigating how innovation can further competitiveness and sustainability in firms and organizations.

Center for Strategic and International Studies (CSIS)

(1800 K Street, Suite 400, Washington, D.C. 20006, (202)775-3266, URL - http://www.csis.org/) CSIS is a public policy research institution dedicated to policy analysis and impact. They maintain resident experts on all the world's major geographical regions and cover many key functional areas domestically and internationally. CSIS has established the **Global Information Infrastructure Commission (GIIC)** (URL - http://www.eds.com/giic/) to foster the development and utilization of information technologies and services in advancing economic growth, education and quality of life in developed and developing countries. GIIC's Internet site provides many links to US and international telecommunication resources.

Center for Telecommunications Research (CTR)

((212)854-2483, fax (212)316-9068, URL - http://www.ctr.columbia.edu/) CTR at Columbia University conducts engineering research and develops educational programs in telecommunications focusing on integrated broadband networks and networks to support mobility including local and wide area nomadic computing with very small portable computers. Their Internet site provides links to mobile computing resources.

Center on Information Technology Accommodation (CITA)

(formerly **Clearinghouse on Computer Accommodation - COCA**) (URL-http://www.gsa.gov/coca/) CITA, run by the **General Services Administration (GSA)**, serves as a clearinghouse for information on making information and computer systems accessible to all users. Their Internet site provides information on making the National Information Infrastructure accessible to the disabled, related legislation and policies, WWW design guidelines, and links to other resources.

CICNet - Rural Datafication Project

(2901 Hubbard Dr., Ann Arbor MI 48109-2467, (313)998-6103, fax (313)998-6105, URL - http://www.cic.net/) CICNet was founded by the **Committee on Institutional Cooperation (CIC)** in 1988, and supports cooperative academic programs among the Midwest's major research institutions. They are bringing the Internet to rural communities and K-12 schools in eight Upper Midwest states with the **Rural Datafication Project** funded in part by the National Science Foundation. CICNet houses one of the largest collections of electronic journals accessible on the Internet.

Coalition for Networked Information (CNI)

(21 Dupont Circle, NW, Washington, D.C. 20036, (202)296-5098, URL - http://www.cni.org/CNI.homepage.html) The Coalition for Networked Information, a joint project of the Association of Research Libraries, CAUSE, and EDUCOM, promotes the creation of and access to information resources in networked environments in order to advance scholarship and to enrich intellectual productivity. The Coalition Task Force representing over 200 institutions and organizations, has initiatives in economic studies and models, navigation & interoperability, transformation of research, and education.

Colorado Internet Cooperative Association (CICA)

(2525 Arapahoe Ave., Bldg. E4-235, Boulder CO 80302, (303)443-3786, fax (303)443-9718, URL - http://www.coop.net/coop/) The Coop is a collection of companies and individuals organized to share Internet resources, at cost in a dedicated and reliable fashion. The Coop is a true legal cooperative and a member-owned organization, with links to "sister" coops around the country.

The Computer Museum

(303 Congress St., Boston, MA 02210, (617)426-2800, URL - http://www.net.org) The Computer Museum features over 170 interactive exhibits including the Networked Planet: Traveling the Information Highway, Walk-Through Computer, multimedia robot show, and one of the most extensive collections of historical computers and robots in the world. An On-Line Museum is scheduled for March, 1996.

Computer Professionals for Social Responsibility (CPSR)

(PO BOX 717, Palo Alto CA 94302 (415)322-3778, fax (415)322-3798, URL - http://snyside.sunnyside.com/home/) CPSR is a public-interest alliance of computer scientists and others interested in the impact of computer technology on society. CPSR provides the public and policy makers with realistic assessments of the power, promise, and limitations of computer technology.

Cross-Industry Working Team (XIWT)

(Reston, VA, URL - http://www.cnri.reston.va.us:3000/XIWT/public.html) XIWT is a multi-industry coalition committed to defining the architecture and key technical requirements for a powerful, sustainable National Information Infrastructure (NII). Various white papers on the NII, electronic commerce, nomadicity and other issues are available on their Internet site.

Discovery Institute

(1201 Third Ave., 40th Floor, Seattle WA 98101-3099, (206)287-3144, fax (206)583-8500, URL - http://www.discovery.org/) Discovery Institute is a non-profit, non-partisan center for national and international affairs looking at the application of advanced technology to individual liberty, representative democracy, free enterprise, internationalism, and the enduring moral principles of civilized society.

Educom

((404)371-1853, fax (404)371-8057, URL-http://www.educom.edu/) Educom serves leaders who manage information technology in higher education. It offers assistance to its member institutions in order to address critical issues surrounding the role of information technology in higher education. **Edupage** is a three-times-a-week electronic newswire summarizing developments in information technology. E-mailed to you free on request in any of ten available languages. See their Internet site for subscription details.

Electronic Frontier Foundation (EFF)

(1550 Bryant Street, Suite 725, San Francisco CA 94103, (415)436-9333, fax (415)436-9993, URL - http://www.eff.org/) The EFF was founded to ensure that the principles embodied in the Constitution and Bill of Rights are protected as new communications technologies emerge. They protect common carriage principles that all network providers carry all speech and are shielded from liability for the actions of users.

EFF supports privacy rights, strong cryptography, broader public access to information, an Open Platform model of the global information infrastructure, and policies to enable public and private information providers to distribute and sell their information products over the Internet. A variety of resources and publications are available to "Netizens" on their Internet site.

Electronic Privacy Information Center (EPIC)

(666 Pennsylvania Ave. SE, Suite 301, Washington, D.C. 20003, (202)544-9240, fax (202)547-5482, URL - http://epic.org/) EPIC is a public interest research center, focusing public attention on emerging civil liberties issues relating to the NII, such as the Clipper Chip, the Digital Telephony proposal, national ID cards, medical record privacy, credit records, and the sale of consumer data. Their Internet site features **Policy Archives** and an **Online Guide to Privacy Resources**.

The George Lucas Educational Foundation

(URL - http://www.glef.org/) The George Lucas Educational Foundation promotes innovative efforts to improve education so all students will be prepared to live and work in an increasingly complex world. They advocate educational strategies incorporating communications media and the latest technologies for transforming schools into places where learning is meaningful, challenging, and exciting. The foundation's biannual newsletter **Edutopia** (current and back issues) is available on their Internet site.

Institute for Computer and Telecommunications Systems Policy (ICTSP)

(at George Washington University, URL - http://www.seas.gwu.edu:80/seas/ictsp/) ICTSP researches the changing nature of telecommunications delivery systems, management information systems, computer networks, compensation for (electronic) intellectual property, and ethics and values among users of computers and communications networks.

Institute for Global Communications (IGC)

(URL - http://www.igc.apc.org/) The IGC serves to expand and inspire movements for environmental sustainability, human and workers' rights, nonviolent conflict resolution, social and economic justice, and women's equality by providing and developing accessible computer networking tools. They host five networks: **PeaceNet**, **Econet**, **ConflictNet**, **LaborNet**, and **WomensNet** as well as a good issues index.

Institute for Policy Innovation (IPI)

(URL - http://www.ipi.org/) IPI is a non-profit public policy "think tank" founded to research, develop and promote innovative and non-partisan solutions to today's public policy problems. IPI focuses on approaches to governing that harness the strengths of individual liberty, limited government, and free markets. A variety of issue reports and policy briefs are available on their Internet site.

Institute of Electrical and Electronic Engineers (IEEE)

(URL - http://www.ieee.org/) IEEE is a non-profit organization, promoting the development and application of electrotechnology and allied sciences for the benefit of humanity, the advancement of the profession, and the well-being of its members. IEEE has technical societies with publications, conferences and support for 37 specialized areas including broadcast technology, communications, computers, information theory, social implications of technology, and systems, man and cybernetics. Their **United States Activity Board (USAB)** has a **Technology Policy Council** with a **Committee on Communications and Information Policy (CCIP)** promoting the formulation of sound legislation, regulation and policies relating to communications, computer and information technology development. Working documents and related position papers are available on the Internet (URL - http://www.ieee.org/usab/DOCUMENTS/FORUM/COMMITTEE/ccip.html).

International Communications Association (ICA)

((800)422-4636, (214)233-3889, fax (214)233-2813, fax-on-demand (214)233-3889 x141) ICA is an independent organization serving the interests of national and multinational telecommunications network application users. ICA represents users of data, voice and video telecommunications equipment and services from over 650 corporations, universities, state and local governments.

International Engineering Consortium

(303 E Wacker Dr., Suite 740, Chicago, IL 60601, (312)938-3500, fax (312)938-8787) The International Engineering Consortium is a cooperative, public service organization dedicated to catalyzing positive change in the information industry and its university communities (ASU and U of A are affiliated).
They publish a Telecom Outlook Report and an Annual Review of Communications.

International Telecom Center (ITC)

(URL - http://www.telematrix.com/toc.html) ITC is sponsored by Telematrix and is an Internet site devoted to resources for telecommunications, data communications and networking. They offer Telecom Reports, links to technical and policy resources as well as listings of telecom and datacom conferences.

Internet Engineering Task Force (IETF)

(URL - http://www.ietf.cnri.reston.va.us/home.html) The IETF is the protocol engineering and development arm of the Internet. It is a large, open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and its smooth operation. It is organized into working group and their proceedings are available on their site.

Internet Law Task Force (ILTF)

(URL - http://www.nptn.org/cyber.serv/solon/iltf/index.html) The ILTF is a counterpart to the IETF and acts as a legal policy forum for those concerned with the evolution and growth of the Internet as a global electronic community that balances terrestrially bound and geographically defined interest with the decentralized and transborder nature of internetworked computer communications.

Internet Society

(URL - http://info.isoc.org/home.html) The Internet Society is a non-governmental international organization for global cooperation and coordination for the Internet and its internetworking technologies and applications. The society includes companies, government agencies, and foundations.

MIT Research Program on Communications Policy

(One Amherst St., E40-218, Cambridge MA 02139, (617)253-4138, fax (617)253-7326,
URL - http://farnsworth.mit.edu/) The MIT Research Program on Communications Policy works with companies, government, and academic leaders to understand and help set the direction for changes in communications and computer technologies. Current projects include digital information infrastructure and multimedia standardization. Substantial resource materials and reports are available on the Internet. Also visit MIT's **Media Lab** (URL - http://www.media.mit.edu/) for the latest multimedia developments.

Morino Institute

(1801 Robert Fulton Dr. Suite 550, Reston VA 22091, (703)620-8971, fax (703)620-4102,
URL - http://www.morino.org/) The Morino Institute is dedicated to opening the doors of opportunity - economic, civic, health, and education - and empowering people to improve their lives and communities in the Communications Age. The Institute has service projects and education programs. Several position papers and a Directory of Public Access Networks are available on their site.

National Association of Development Organizations (NADO)

(444 N Capitol St. NW, Suite 630, Washington, D.C. 20001, (202)624-7806, fax (202)624-8813)
NADO is a public interest group devoted to the promotion of economic development in small metropolitan and rural areas and a leading advocate for a regional approach to economic and community development. Their **Research Foundation** has a **Telecommunications Awareness Project** to promote telecommunications as a tool for economic development, rather than a stumbling block, for small cities and rural areas. They have a brief report (8/95) "Understanding Universal Service: Its Impact on Rural America and Prospects for the Future" and a white paper (4/94) "Telecommunications and its Impact on Rural America." Their **Economic Development Digest** can be found at Utah State University's OuR-TOWN Project, URL - http://ourtown.sunrem.com/html/nado1.html .

The National Distance Learning Center

((502)686-4556, URL - http://www.occ.uky.edu/) The NDLC currently is operating two services: a free-to-use database of distance learning information and an Internet access system for Western Kentucky.

National Information Infrastructure Testbed (NIIT)

(600 World Trade Center, 1625 Broadway, Denver CO 80202, (800)299-9973, fax (303)572-5499, URL - http://www.niit.org/) The NIIT consortium was created to accelerate the development and use of national and global information infrastructures by creating practical applications to address real-world needs. NIIT's advanced telecommunications and computing testbed enables interoperability and integration testing on an unprecedented scale and where its members can learn, through practical experience, which applications will drive the information superhighway and emerging markets.

National Public Telecomputing Network (NPTN)

(URL - http://www.nptn.org/) The NPTN is a nonprofit corporation which serves as the parent organization for **"Free-Net"** community computer network systems world wide. NPTN helps local communities organize teams to bring a community computing network system online in rural or metro settings, and further supports affiliates with a growing collection of content called Cybercasting Services.

Pacific Telecommunications Council (PTC)

(URL - http://www.ptc.org/) PTC is an international, non-profit, non-governmental membership organization for providers and users of communications services, policy-makers, technologists, lawyers, scientists and academics. PTC publishes a variety of materials on ideas and issues relevant to telecommunications in the Asia-Pacific region, many are available on their Internet site.

Project Vote Smart

((800)622-7627, URL - http://www.vote-smart.org/) Project Vote Smart's Internet site is a one-stop shopping center for political information linking their own unique database with other Internet sources. They track Congressional members' voting records, administer a National Political Awareness Test, provide issue information, run a **Voter's Research Hotline** and a **Reporter's Resource Center**.
They also index federal and state government resources, political parties and ideological organizations.

Progress and Freedom Foundation (PFF)

(URL - http://www.pff.org/) The PFF is a public policy think tank whose mission is to restore, renew, and recreate America's sense of its future, a future woven inextricably with the ideas of progress and freedom. Their **Cyberspace and the American Dream** project explores the consequences and the direct policy implications of the information revolution. Background and positions can be found on their Internet site.

The Rand Corporation

(Headquarters - 1700 Main St., Santa Monica CA 90401-3297, (310)393-0411, fax (310)393-4818; Washington Research Office - 2100 M St. NW, Washington, D.C. 20037-1270, (202)296-5000, fax (202)296-7960, URL - http://www.rand.org/) RAND is a nonprofit institution that helps improve public policy through research and analysis. Following their inception after World War II, RAND focused on national security but since has come to address problems of domestic policy helping policy makers strengthen the nation's economy, maintain its security, and improve its quality of life. Their Internet site features bibliographies of their major research areas and issues of the **RAND Research Review** (Fall, 1995 was on Information War and Cyberspace Security). Of significance to the Universal Service/Access debate is their recent study "Universal Access to E-Mail: Feasibility and Societal Implications," available online.

Rural Consumers Coalition for the Advancement of Telecommunications

(URL- http://policy.net/rural/) Composed of organizations, individuals and businesses representing rural consumers of telecommunications who have united because of their concerns about the future of telecommunications in rural America. The purpose of the coalition is to impact telecommunications legislation and subsequent regulatory proceedings implementing such legislation. Their Internet site has background and analysis of pending Federal legislation and other rural telecommunications resources.

Smart Valley, Inc.

(2520 Mission College Blvd., Suite 202, Santa Clara, CA 95054, (408)562-7707, fax (408)562-7677, URL - http://www.svi.org/) The Smart Valley vision is to create an electronic community in the Bay Area by developing an advanced information infrastructure and the collective ability to use it. As a public-private coalition, their mission is to facilitate the construction of pervasive, high speed communications system and information services that will benefit all sectors of the community and drive economic development.

The Society for Electronic Access (SEA)

(PO Box 7081, New York, NY 10116-7081, (212)592-3801, URL - http://www.sea.org/) SEA promotes civil liberties and access in cyberspace for everyone. They work to educate people about computer networks, and how to use them to find information and to communicate with one another.

Southern Growth Policies Board

(PO BOX 12293, Research Triangle Park NC 27709, (919)941-5145, fax (919)941-5594)
The Southern Growth Policies Board seeks to promote regional economic development (14 Southern states + 1 territory) by harmonizing state telecommunications regulation. They have several publications profiling telecommunications regulation and promoting an agenda of related policies and principles.

The Taxpayers Assets Project (TAP) & The Consumer Project on Technology (CPT)

(PO BOX 19367, Washington, D.C. 20036, (202)387-8030, fax (202)234-5176, URL - http://www.essential.org/tap/) TAP was founded by Ralph Nader in 1988 to monitor the management and sale of government property. It now focuses on: public access to government information; natural resources and public lands; pricing of drugs developed with Federal funds; telecommunications policy. Their Consumer Project on Technology concentrates on telecommunications regulation, ISDN pricing, fair use under the copyright laws, and the impact of technology on personal privacy.

Tech Corps

(URL - http://www.ustc.org/) Tech Corps is a national, non-profit organization of technology volunteers, funded by the business community, helping to improve K-12 education at the grass roots, through the effective integration of technology into the learning environment. They plan to be operating in all states by the beginning of the Fall, 1996 school year and actively recruiting school districts for participation.

Town Hall

(214 Massachusetts Ave. NE, Washington, D.C. 20002, (800)441-4142, (202)547-6368, fax (202)544-7330, URL - http://www.townhall.com/) Town Hall is a interactive community on the Internet bringing Internet users and public policy organizations together under the broad umbrella of "conservative" thoughts, ideas, and actions. Their goal is to become a mall of ideas in which people congregate to exchange, discuss, and disseminate the latest news, views, and information through electronic medium.

U.S. Chamber of Commerce

((202)463-5560, URL - http://www.uschamber.org/) The U.S. Chamber of Commerce is a coalition of the local and state Chambers of Commerce and represents their interests at the national level. They develop and promote policy on many issues, and their **Telecommunication Infrastructure Task Force** is active in the telecom infrastructure debate representing the small business users with community emphasis.

Voters Telecommunications Watch (VTW)

(URL- http://www.vtw.org/) VTW is a volunteer organization, concentrating on legislation as it relates to telecommunications and civil liberties. They publish a weekly **BillWatch** when Congress is in session, have a technology pledge and questionnaire for politicians, host a Congressional directory service, and have other legislative information and links to activist policy groups.

World Future Society (WFS)

(7910 Woodmont Ave., Suite 450, Bethesda MD 20814, (800)989-8274, (301)656-8274, fax (301)951-0394, URL - http://www.tmn.com/wfs/wfshome.html) WFS is an association of people interested in how social and technological developments are shaping the future, serving as a neutral clearinghouse for forecasts, recommendations, and alternatives.

Publishers & Publications:

(Note: This section only includes periodicals particularly relevant to telecommunications policy. In Appendix C, you will find Internet links to quite a few others that have a broader computer or technological reach or a general public policy and information scope.

Angus TeleManagement Group

(8 Old Kingston Rd., Ajax, Ontario, Canada L1T 2Z7, (905)686-5050, fax (905)686-2655, URL - http://www.angustel.ca/) Angus TeleManagement Group is an independent consulting and research firm, specializing in business telecommunications, supporting clients across Canada and around the world, providing a full range of advisory services. Their weekly **Telecom Update** is available online as is some content and indexes for their monthly subscription **Telemanagement** and details about their reports.

AT&T Technology Magazine

(URL - http://www.att.com/att-technology/) AT&T's quarterly periodical is available online in Adobe PDF format as well as access to some other telecom resources.

BRP Publications

(1333 H St., NW, 2nd Floor - West, Washington, D.C., 20005, (800)822-6338, URL - http://brpinc.com/brp/) BRP Publications provides information on telecommunication, multimedia, data networking, and human resources. BRP's **Telecommunications Group** publishes **Telecommunications Reports, TR Daily, Communications Billing Report, State & Local Communications Report, TR Wireless News, Telco Competition Report, The Cable-Telco Report** and **Communications Business & Finance**. Their **Multimedia Group** publishes another 8 titles including **Information & Interactive Services Report, Multimedia Daily** and **Report on Electronic Commerce**. Lead stories to all these newsletters can be found online as well as information on BRP's reports and links to telecom related sites.

Educom

(URL - http://www.educom.edu/) Educom (described in above section) provides 3 periodicals. **Edupage** is a free three-times-a-week electronic newswire (available in 10 languages) summarizing developments in information technology and sent to your e-mail address. **Educom Update** (twice monthly) covers the organization and education issues. **Educom Review** (bimonthly print magazine at $18/year) explores the convergence of learning, communications, and information technology.

Federal Communications Law Journal

(URL - http://www.law.indiana.edu/fclj/) Selected full issues are available online including the classic December, 1994 Special Issue on the Sixtieth Anniversary of the Communications Act of 1934.

Government Technology

(9719 Lincoln Village Dr. Suite 500, Sacramento, CA 95827, (916)363-5000, (916)363-5197, URL - http://www.GOVTECH.net/) This free monthly trade publication covers government projects and solutions as well as resources for governance in the information age. Current and back issues (1989 on) are available online as well as information on conferences, links to other Web sites and other resources.

Jupiter Communications

(627 Broadway, New York, NY 10012, (212)780-6060x113, URL - http://www.jup.com/) Jupiter Communications is a New York City-based research, consulting and publishing firm specializing in emerging consumer online and interactive technologies. On their Internet site are excerpts of their newsletters and reports plus the Yahoo!/Jupiter Web User Survey Report (demographic research.).

Law Journal Extra! (LJX)

(URL - http://www.ljx.com/) LJX provides a wealth of online legal news and resources. They also host online forums on **Business and Legal Aspects of the Internet and Online Services** (moderated by Lance Rose of Phoenix's Lewis & Roca) and **Intellectual Property Rights in the Electronic Age**.

The Network Observer (TNO)

(URL - http://communication.ucsd.edu/pagre/tno.html) The Network Observer is a free on-line newsletter about networks and democracy. Current and back issues are available as well as useful Internet links.

Phillips Business Information, Inc.

(1201 Seven Locks Rd., Potomac, MD 20854, (800)777-5006, URL - http://www.phillips.com:3200/) Phillips Business Information Inc. publishes a broad range of high quality information products for distinct business markets. Their subscription newsletters include **Washington Telecom News, Global Telecom Report, Local Telecom Competition News, Broadband Networking News, Interactive Video News, Land Mobile Radio News**, and **Wireless Business and Finance**. Their Internet site features content and resources from their **Internet Week** and **Defense Daily** publications.

Public Utilities Fortnightly

(PO Box 1110, Pearl River, NY 10965-9934, (800)421-4494, fax (914)735-5411) This subscription print magazine focuses on public utility energy business but also covers telecommunications.

Public Utility Report (PUR) Utility Weekly

(8229 Boone Blvd. Suite 401, Vienna, VA 22182, (800)368-5001) PUR covers state commission rulings and federal regulatory issues for public utilities, mostly energy with some telecommunications content.

Quality Education Data (QED)

(1600 Broadway, 12th Floor, Denver, CO 80202-4912, (800)525-5811, (303)860-1832, fax (303)860-0238) QED publishes a variety of educational technology surveys and reports including "Networks Now 1995: A Survey of How Schools Use Telecommunications Networks in Education," "Educational Technology Trends," "Technology in Public Schools," "Technology Purchasing Forecast," and directories of educational staff (i.e., Library Media Specialists, Technology Coordinators).

Telecom Digest

(URL - http://www.wiltel.com/telecom/) Telecom Digest is an electronic journal with WWW access provided by LDDS WorldCom Network. It also appears as a Usenet moderated newsgroup (**comp.dcom.telecom**) devoted mostly but not exclusively to telecommunications topics. It features telecom FAQs, articles by George Gilder and access to an online Telecom Library.

The Telecomm Publishing Group

(PO Box 1455, Alexandra, VA 22313-2055, (800)327-7205, URL - http://guess.worldweb.net/tpg/) TPG has been covering the telecommunications industry for more than 10 years with newsletter, reports and conferences. Their newsletters include **FCC Report, State Telephone Regulation Report, Local Competition Report, Telco Business Report, The Report on AT&T, Interactive TV Strategies**, and **Mobile Data Report**. Their online **Telecom Information Clearinghouse (TIC)** features **Telecom AM** (daily top stories), **Telecom Lingo Guide Online**, and access to extensive telecom Internet links.

Telecommunications Magazine

(URL - http://www.telecoms-mag.com/) Telecommunications is a technology and business monthly for communications professionals. Their Internet site features recent issues and selected articles as well as information on upcoming trade shows and the telecom industry.

Telecomreg

(URL - http://www.wiltel.com/telecomr/) This e-mail discussion list (**telecomreg**) has been established to facilitate discussion about telecommunications regulation on the local, state, and federal levels. Regulatory issues involving cable, broadcasting, telephony, and data transmission are covered, as are related economic and social issues. LDDS WorldCom Network (as they do for Telecom Digest above) provides WWW access to the archive. Free subscription information can be found online.

Voice of America (VOA)

((202)619-2538, URL - gopher://gopher.voa.gov:70/11/) VOA is one of the top three international broadcasters (along with BBC and Radio Moscow) reaching an estimated 92 million listeners worldwide. VOA provides Internet access to their wire service news, audio clips to download, radio program and frequency schedules, Worldnet TV schedules and satellite downlink information, and more.

Washington Researchers

(PO Box 19005, Washington, D.C. 20036-9005, (202)233-3499, URL - http://www.researchers.com/pub/busintel/researchers.html) Washington Researchers publish a wide range of directories, handbooks, and newsletters for the executive and professional researcher. Their subscription newsletters on traditional (print) sources, **The Washington Report** and **The International Information Report**, are now complemented by **The Information Freeway Report**, featuring the best and newest of business and government information resources available online.

Washington Telecom Newswire

(URL - http://www.com/wtn/) Washington Telecom Newswire is a subscription service offering same day, accurate, spot news coverage of events primarily in Washington, D.C., affecting the telecommunications industry. Coverage includes significant legislation on Capitol Hill, activities at the FCC and issues before the courts. Sample articles are available on their Internet site.

WIRED - HotFlash/HotWired

(URL - http://www.hotwired.com/) HotFlash is a weekly newsletter of HotWired send on request to your e-mail inbox. On WIRED's Internet site, their is a wide range of information and resources on telecom related issues, computer and media driven social change, and cyberculture.

Ziff-Davis Publishing/ZDNet

(URL - http://www.zdnet.com/) Ziff-Davis Publishing's home on the net features content from their many technology periodicals including Computer Gaming, Computer Life, Computer Shopper, Inter@ctive, Internet Life, PC Computing, PC Magazine, PC Week, Mac User, Mac Week and Windows.

UNIVERSAL SERVICE TO UNIVERSAL ACCESS:

THE PARADIGM SHIFT IN CITIZENS' USE OF TELECOMMUNICATIONS

Appendix C - Summary of Telecommunication Policy Resources on the Internet

Note:

This appendix is an updated version from the report **"Universal Service to Universal Access: The Paradigm Shift in Citizens' Use of Telecommunications."** The content is © 1995-1996 by International Research Center and the sole property of the State of Arizona (Contract No. A6-0028-001) with all rights reserved. The entire report including this appendix will be available in updated form on a Web site under development by the **Arizona Governor's Office of Telecommunications Policy** (John B. Kelly, Executive Director at voice (602)542-0142, fax (602)542-0134, e-mail - jkelly@ad.state.az.us , URL - http://www.state.az.us/tpo/).

Internet resources and sites are dynamic in nature. Locations (URLs) change, useful sites become temporarily unavailable or go away entirely, and new sites arise and flourish. In this actively evolving web of information resources, use these starting points for your own telecommunications policy explorations. Please notify **International Research Center** (Mark Goldstein at voice & fax (602)470-0389, e-mail - markg@xroads.com) of sites that become unavailable or new resources you've uncovered. International Research Center undertakes a wide variety of custom research projects for business and public policy clients. Please contact us to discuss your current and upcoming research requirements.

State of Arizona Resources:

Arizona State Government Home Page	**http://www.state.az.us/**
Arizona Governor's Homepage	http://www.state.az.us/gv/index.html
Arizona Governor's Office of Telecommunications Policy	http://www.state.az.us/tpo/
Arizona Legislative Information System (ALIS) Online	http://www.azleg.state.az.us/
AZ Legislative Tracking (ASU/AZ Capitol Times)	gopher://info.asu.edu:70/11/asu-cwis/pctp/legact
Arizona State Agency Index	http://www.state.az.us/pages/agencyin.htm
Arizona Department of Education (ADE)	http://www.ade.state.az.us/
Academic Service Division	http://www.ade.state.az.us/asd/index.html
Arizona K-12 School Web Sites	http://www.ade.state.az.us/schools/index.html
ASPIN K-12 Home Page	http://aspin.asu.edu/~aspin/phaseIII/
K-12+ Servers in Arizona	http://www.tenet.edu/education/states/arizona.html
The Arizona School Web	http://www.isdnet.com/azedweb.htm
Web66 Arizona K-12 Schools	http://web66.coled.umn.edu/schools/US/Arizona.html
K-12 Educational Resources	http://www.ade.state.az.us/dataview/hotlinks.html
AZ School Services through Educational Technology (ASSET)	http://www.kaet.asu.edu/asset/asset.htm
CNIDR WWW Servers for Education	http://kudzu.cnidr.org/Education/education.html
EdWeb (exploring technology and school reform)	http://k12.cnidr.org:90/
Science Learning Network	http://www.sln.org/
Arizona Information Technology	http://www.state.az.us/pages/info_tec.htm
Department of Administration (DOA)	http://www.state.az.us/ad/ad.html
Department of Commerce (DOC)	http://www.state.az.us/ep/commhome.shtml
Arizona Business Assistance Center	http://www.state.az.us/ep/abc/abc.shtml
Arizona Business Connection	http://www.state.az.us/ep/abc/abcinfo.shtml
Arizona Film Commission	http://www.state.az.us/ep/mopic/mopic.shtml
Arizona Film and Video Production	http://www.bensonassoc.com/bensonassoc/film/home.html
Arizona Online Film Production Directory	http://www.primenet.com/arizona/index.html
International Trade and Investment	http://www.state.az.us/ep/itrade/itrade.shtml
National Marketing (business relocation support)	http://www.state.az.us/ep/natmrk/natmrk.shtml
Office of High Technology	http://www.state.az.us/ep/hightech/hightech.shtml
Arizona High Technology Annual Report	http://www.state.az.us/ep/hightech/htech.shtml
Strategic Planning	http://www.state.az.us/ep/stratpln/stratpln.shtml
Department of Library, Archives and Public Records (DLAPR)	http://dlapr.lib.az.us/
Arizona U.S. Congressional Delegation	http://aspin.asu.edu/~pctp/azdeleg.html
Arizona State & Local Government (Library of Congress)	http://lcweb.loc.gov/global/state/az-gov.html

Arizona Non-Governmental Resources:

Arizona Geographic Information Council (AGIC)	http://www.state.az.us/gis3/agic/agichome.html
Arizona Humanities Council	http://aztec.asu.edu/ahc/homepage.html
Arizona Newspaper Association (ANA)	http://www.infop.com/ana/index.html
Arizona Central (Republic/Gazette/PNI)	http://www.azcentral.com/
The Arizona Daily Star (Tucson, StarNet)	http://azstarnet.com/
The Arizona Daily Wildcat (Tucson, U of A)	http://www.arizona.edu/pubs/wildcat/wildcat.html
The Business Journal (Phoenix)	http://www.phxbj.com/
The Daily Territorial, Inside Tucson Business	http://www.infop.com/terr/ ,
http://www.infop.com/territ/	
The Lumberjack (Flagstaff, NAU)	http://www.thejack.nau.edu/
The State Press Internet (SPIN - Tempe, ASU)	http://aspin.asu.edu/provider/StatePress/
Other Arizona Periodicals:	
Arid Lands Newsletter	http://ag.arizona.edu/OALS/ALN/ALNHome.html
Arizona Highways	http://www.arizhwys.com/
Arizona Outdoorsman	http://www.netchex.com/azoutdrs/
Computer Buyer	http://www.giaco.com/cb/
Echo Magazine (w. Out on the Net)	http://www.comeout.com/echo/
Entertainment Magazine On-Line (EMOL)	http://emol.org/emol/index.html
Free Press (Prescott Independent)	http://www.bsinet.com/accounts/frepress/www/index.html

LaVidaBuena (SE Arizona)	http://www.lavida.com/
New Times (Phoenix Alternative Weekly)	http://www.phoenixnewtimes.com/
Planet Magazine	http://www.planetmag.com/
Tucson Weekly (DesertNet - Tucson Alternative Weekly)	http://desert.net/tw/twhome.htm
The Weekly Observer (Tucson Gay/Lesbian News)	http://bonzo.com/observer/
Arizona Procurement Technical Assistance Program (APTAN)	(Ventech dial-in (602)945-4106 & (800)711-0502)
Arizona Science Center	http://aztec.asu.edu/government/Tempe/asc/asc.html
Arizona Software Association (ASA)	http://www.azsoft.com/
Arizona Telecommunications and Information Council (ATIC)	(e-mail - atic@rtd.com, WWW pending)
Arizona Telecommunications Community (AzTeC) Computing	http://aztec.asu.edu/
AzTeC Medical Page	http://aztec.asu.edu/medical/med.html
AzLaw (Online Legal Resource)	http://www.azlaw.com/
Community And City of Tucson Information NETwork (CACTI-NET)	gopher://econ.tucson,az.us/
Community Information and Telecommunications Alliance & Tucson Link	http://tucsonlink.rtd.com/
Datalink Project (NAFTA/Trade Information Pilot) http://www.halycon.com/pickard/CANAMEX/	
Disabilities Help Line of Arizona	http://sunrise.cirs.org/disabilities.html
Electronic Commerce Net (ECNet-Joint project Cox, ASU, DEC)	http://www.phx.cox.com/ecnet/ecnet.htm
Enterprise Network (EN)	http://www.en.org/eni/index.html
Environmental Recycling Hotline	http://www.primenet.com/erh.html
Governor's Strategic Partnership for Economic Dev.(GSPED)	http://www.state.az.us/ep/stratpln/gsped.shtml
HomeBased Business Association of Arizona (HBBA)	http://www.getnet.com/softrain/hbba/
Information and Referral Services (Tucson)	http://www.azstarnet.com/public/packages/ir/i&rdir.htm
Directory of Helping Services in Southern Arizona	
Joint Interoperability Test Command (JITC) - Fort Huachuca	http://jitc-emh.army.mil/
National Law Center for Inter-American Free Trade	http://www.natlaw.com/
The Nature Conservancy - Arizona Chapter	http://hanksville.phast.umass.edu/defs/independent/AZNC/AZlist.html
Special Libraries Association (SLA) - Arizona Chapter	http://hinet.medlib.arizona.edu/SLA/
Teleservices Industry Group (TIG - Tucson)	http://www.futurewest.com/gtec/tele.htm
World Trade Center Arizona (WTCAZ)	http://www.banet.com/wtcaz/wtcaz.htm

Arizona Counties:

Cochise County	http://www.primenet.com/~vermill/cc/cc.html
Maricopa County Governement	http://www.maricopa.gov/welcome.html
Maricopa Association of Governments (MAG)	http://www.maricopa.gov/mag/mag.html
Maricopa County Library	telnet://library.maricopa.gov/ (username=library)
Superior Court of Arizona in Maricopa County	http://www.maricopa.gov/supcrt/homepg2.html
Pima County Government	http://www.pima.gov/
Justice Courts	http://jp.pima.gov/
National Association of Counties (NACo)	http://pti.nw.dc.us/naco.htm

Arizona Cities, Towns and Destinations:

Arizona State Parks	http://www.pr.state.az.us/
Apache Junction	http://ajnet.ci.apache-jct.az.us/
Chandler	http://www.primenet.com/~chandler/
Flagstaff	http://www.flagstaff.az.us/
Greater Flagstaff Economic Council (GFEC)	http://www.flagstaff.az.us/gfec.html
Ghost Towns of Arizona	http://www.indirect.com/www/pjcat/ghost.html
Gilbert	http://www.ci.gilbert.az.us/
Glendale	http://webber.maricopa.gov/glendale/
Grand Canyon National Park	http://star.ucc.nau.edu/~grandcanyon/
Grand Canyon Tour	http://www.gorp.com/gcjunkies/canyon.htm
Kearny	http://enws347.eas.asu.edu/~nebeker/kearny.html
Mesa	http://www.ci.mesa.az.us/
Phoenix (at your Fingertips, dial-in (602)534-4300)	http://www.ci.phoenix.az.us/
The Heard Museum	http://www.heard.org/
Phoenix Art Museum	http://aztec.asu.edu/AandE/phoenix.art/index.html
Phoenix Public Library Valleycat	telnet://pac.lib.ci.phoenix.az.us

The Phoenix Zoo	http://aztec.asu.edu/phxzoo/homepage.html
Prescott	http://www.amug.org/~fpc/prescott.html
Salt River Pima-Maricopa Indian Community	http://www.saltriver.pima-maricopa.nsn.us/
Scottsdale	http://www.ci.scottsdale.az.us/
Sedona	http://www.sedona.net/sedona.html
Sierra Vista	http://www.primenet.com/~woodall/sierra.html
Tempe	http://aztec.asu.edu/government/Tempe/tmpmain.html
Tempe Historical Museum	http://aztec.asu.edu/government/Tempe/docs/museum.html
Tucson	http://tucson.com/tucson/
Greater Tucson Economic Council (GTEC)	http://www.futurewest.com/
Yuma	http://www.primenet.com/~mlauss/
National League of Cities (NLC)	http://pti.nw.dc.us/nlc.htm
City.Net (Arizona cities on the web)	http://www.city.net/countries/united_states/arizona/

Arizona Higher Education:

Arizona Board of Regents	http://info.asu.edu/arizona/azbor/homepage.html
Arizona State University (ASU - Tempe)	http://www.asu.edu/
Arizona/Sonora NAFTA Internet Page	http://aspin.asu.edu/~nafta/
Arizona State Public Information Network (ASPIN)	http://aspin.asu.edu/
Computer Integrated Manufacturing (CIM) Systems Research Center	http://enws324.eas.asu.edu/
Economic Data - ASU College Of Business	http://www.cob.asu.edu/seid/asedd.html
Public Communications Technology Project (PCTP)	http://aspin.asu.edu/~pctp/
Telecommunications Research Center	http://emelc1.eas.asu.edu/
Walter Cronkite School of Journalism & Telecommunication	http://cronkite.pp.asu.edu/
Arizona Western College (AWC - Yuma)	http://www.awc.cc.az.us/
Central Arizona College (CAC - Coolidge)	http://www.cac.cc.az.us/
Cochise Community College (Douglas)	http://www.cochise.cc.az.us/
Eastern Arizona College (EAC - Thatcher)	http://www.eac.cc.az.us/
Embry-Riddle Aeronautical University	http://www.pr.erau.edu/
Maricopa Community Colleges (11 Campuses)	http://www.maricopa.edu/
Midak University (Phoenix)	http://www.midak.com/
Mohave Community College (Kingman)	http://www.mohave.cc.az.us/
Northern Arizona University (NAU - Flagstaff)	http://www.nau.edu/
Pima Community College (Tucson)	http://www.pima.edu/
Prescott College	http://aztec.asu.edu/prescott.col/
University of Arizona (U of A - Tucson)	http://www.arizona.edu/
Center for Creative Photography	http://dizzy.library.arizona.edu/branches/ccp/ccphome.html
Images of the Southwest	http://dizzy.library.arizona.edu/images/library-images.html
University of Phoenix	http://www.uophx.edu/
Electronic Information News Center/Virtual Library	http://204.17.16.101/lrc2.html
Yavapai Community College (Prescott)	http://www.yavapai.cc.az.us/
American Universities Index (+ links to CC, International)	http://www.clas.ufl.edu/CLAS/american-universities.html

Arizona Directory Sites:

Arizona Arts and Entertainment Bulletin Board	http://aztec.asu.edu/AandE/bulletin/bulletin.html
The Arizona BusinessWeb Directory	http://biz.rtd.com/
Arizona Destinations	http://www.amdest.com/
Arizona Gold	http://www.goldpage.com/travel/arizona/
Arizona Guide (Arizona Office of Tourism)	http://www.arizonaguide.com/
The Arizona Info-Net	http://www.primenet.com/~randmo/
Arizona Information Center	http://www.azinfo.com/menu.htm
Arizona's WebHub	http://www.rhinonet.com/webhub/
The Arizona Web	http://arizonaweb.org/
Arizona Web Servers	http://www.eas.asu.edu/az/servers.html
AtoZinAZ	http://www.atozinaz.com/
Kiosk Arizona	http://www.vii.com/~icis/kioskaz/home.htm
City.Net (Arizona cities on the web)	http://www.city.net/countries/united_states/arizona/
Yahoo! Directory - Arizona Sites	http://www.yahoo.com/Regional/U_S__States/Arizona/

Miscellaneous Arizona Related Sites:

Arizona Chambers of Commerce http://www.catalog.com/biz-net/state/az.html
Arizona High Tech Directory http://www.primenet.com/~keiland/
Arizona State Technology Extension Program (STEP) http://www.syspac.com/~mdixon/step.html
The Computer Events Directory - Arizona http://www.kweb.com/place/usa_AZ.html
EXPO Guide - Arizona (trade shows & conventions) http://www.expoguide.com/shows/data/loc_az.htm
AZConnect (Political and Public Affairs) http://www.getnet.com/azconnect/
Arizona Macintosh Users Group (AMUG) http://www.amug.org/index.html
Phoenix PC Users Group (PCUG) http://www.phoenixpcug.org/
Tucson Computer Society http://www.azstarnet.com/public/nonprofit/tcs/home.htm
Hytelnet - Library Catalogs:USA:Arizona http://library.usask.ca/hytelnet/usa/AZ.html

Federal Government - Telecommunication Resources :

General Federal Access Points:

CapWeb (Policy Net) http://policy.net/capweb.congress.html
Connect Directly to U.S. Government Agencies (DOC ITA) http://www.itaiep.doc.gov/eebic/cduga.html
Federal Web Locator (Villanova Center for Info. Law & Policy) http://www.law.vill.edu/
FedWorld Information Network (NTIS) http://www.fedworld.gov/
Government of Canada Gateway http://canada.gc.ca/
Government Information Locator Service (GILS) http://info.er.usgs.gov/gils/index.html
Infomine (Comprehensive Government Info Resource Locator) http://lib-www.ucr.edu/govpub/
U.S. Federal Government Agencies http://www.lib.lsu.edu/gov/fedgov.html

Federal Branches, Departments and Agencies:

Congress (THOMAS Legislative Information) http://thomas.loc.gov/
U.S. House of Representatives http://www.house.gov/
U.S. Senate http://www.senate.gov/
Virtual Tour of the Capitol http://www.senate.gov/capitol/virtour.html
Office of Technology Assessment (OTA - closed 10/1/95) http://www.ota.gov/
OTA Sustaining Site at Idaho State University http://bilbo.isu.edu/ota/ota.html
Congressional Quarterly (CQ) gopher://gopher.cqalert.com/, http://voter96.cqalert.com/
LEGI-SLATE Gopher Service http://gopher.legislate.com/
The C-SPAN Networks http://www.c-span.org/
Department of Agriculture (USDA) http://www.usda.gov/
Rural Economic & Community Development http://www.rurdev.usda.gov/recdhome.html
Rural Utility Services (RUS) http://www.rurdev.usda.gov/agency/rus/html/rus_home.html
Department of Commerce (DOC) http://www.doc.gov/
Department of Commerce Agencies http://www.doc.gov/resources/doc.agencies.html
Commerce Information Locator Service (CILS) http://www.doc.gov/inquery/cils.html
National Telecommunications and Information Admin.(NTIA) http://www.ntia.doc.gov/
Institute for Telecom Sciences (ITS) http://www.its.bldrdoc.gov/its.html
Other Telecommunications and Information Sources http://www.ntia.doc.gov/infsites.html
National Institute of Standards and Technology (NIST) http://www.nist.gov/
Advanced Technology Program (ATP) http://www.atp.nist.gov/
Computer Security Resource Clearinghouse http://cs-www.ncsl.nist.gov/
Office of Technology Policy PACE (Competetive Economy) http://www.doc.gov/pace/pacepge.html
Bureau of the Census http://www.census.gov/
International Trade Administration (ITA) http://www.itaiep.doc.gov/eebic/cduga.html
Patent and Trademark Office http://www.uspto.gov/
U.S. Patent Bibliographic Data at CNIDR http://patents.cnidr.org:4242/
Stat-USA (business and economic information) http://www.stat-usa.gov/
National Trade Data Bank (NTDB) http://www.stat-usa.gov/BEN/Services/ntdbhome.html
National Economic,Social & Environmental (NESE) http://www.stat-usa.gov/BEN/Services/nesehome.html
Economic Bulletin Board/Lite Edition (EBB/LE) http://www.stat-usa.gov/BEN/Services/ebbhome.html
Department of Defense (DOD) Advanced Research Projects Agency (ARPA) http://www.arpa.mil/
DefenseLINK http://www.dtic.dla.mil/defenselink/

Defense Technical Information Web	http://www.dtic.dla.mil/dtiw/
Defense TechTRANSIT (Technology Transfer/Dual Use)	http://www.dtic.dla.mil/techtransit/
National Security Agency (NSA)	http://www.nsa.gov:8080/
The Center for Defense Information (CDI)	http://www.cdi.org/
E-Hawk Cadre (MIL-CAT, De re militari, MIL-HIST)	http://www.olcommerce.com/cadre/index.html
MILNET - Open Source Military Information Database	http://www.onestep.com/milnet/
Department of Education (DOE)	http://www.ed.gov/
National Institute on Disability and Rehabilitation Research (NIDRR)	http://www.ed.gov/offices/
Department of Energy (DOE) Science Education & Technical Information	http://www.doe.gov/html/home2.html
Department of Health and Human Services (DHHS)	http://www.os.dhhs.gov/
National Library of Medicine (NLM)	http://www.nlm.nih.gov/
Federal Communications Commission (FCC)	http://www.fcc.gov/
Common Carrier Bureau (CCB)	http://www.fcc.gov/ccb.html
Cable Services Bureau (CSB)	http://www.fcc.gov/csb.html
Mass Media Bureau (MMB)	http://www.fcc.gov/mmb.html
Wireless Telecommunications Bureau (WTB)	http://www.fcc.gov/wtb.html
High-Performance Computing and Communications (HPCC)	http://www.hpcc.gov/
Information Infrastructure Task Force (IITF)	http://iitf.doc.gov/
Telecommunications Policy Committee (TPC) gopher://ntiant1.ntia.doc.gov:70/11s/iitf/telecom	
Information Policy Committee (IPC)	gopher://ntiant1.ntia.doc.gov:70/11s/iitf/infopol
Committee on Applications and Technology (CAT)	gopher://ntiant1.ntia.doc.gov:70/11s/iitf/appstech
NII Advisory Council (NIIAC)	http://iitf.doc.gov/AdCoun.html
NII Virtual Library	http://nii.nist.gov/nii.html
Library of Congress (LOC)	http://www.loc.gov/
Global Electronic Library	http://lcweb.loc.gov/global/globalhp.html
U.S. Copyright Office	http://lcweb.loc.gov/copyright/
National Academy of Sciences (NAS)	http://www.nas.edu/
(National Research Council-NRC, National Academy of Engineering-NAE, National Academy Press-NAP)	
National Aeronautics and Space Administration (NASA)	http://www.nasa.gov/
NASA Space Shuttle Home Page	http://www.law.vill.edu/
Advanced Communications Technology Satellite	http://kronos.lerc.nasa.gov/acts/acts.html
National Science Foundation (NSF)	http://www.nsf.gov/
Science and Engineering State Profiles	http://www.nsf.gov:80/sbe/srs/statepro/start.htm
National Technical Information Service (NTIS)	http://www.fedworld.gov/ntis/ntishome.html
Securities and Exchange Commission (SEC with Edgar data)	http://www.sec.gov/
Edgar Development Project at NYU Stern School of Business	http://edgar.stern.nyu.edu/
Smithsonian Institution (Main Server)	http://www.si.edu/start.htm
Smithsonian Institution (Mirror Site - California)	http://www.si.sgi.com/sgistart.htm
The White House - Executive Branch	http://www.whitehouse.gov/
White House Archives at Texas A&M	http://www.tamu.edu/whitehouse/
Office of Management and Budget (OMB)	http://www.whitehouse.gov/WH/EOP/omb
Office of Science and Technology Policy (OSTP)	http://www.whitehouse.gov/OSTP.html

Miscellaneous Federal Government Sites:

National Archives and Records Administration (NARA)	http://www.nara.gov/
National Technology Transfer Center (NTTC)	http://www.nttc.edu/
SBIR/STTR Solicitations and Awards	http://www.nttc.edu/solicitations.html
U.S. Government Information Sources	http://www.nttc.edu/gov_res.html
Small Business Administration (SBA)	http://www.sbaonline.sba.gov/
U.S. Business Advisor	http://www.business.gov/
The EC/EDI & CALS Resource Locator	http://www.fedworld.gov/edicals/locator.html
Government Printing Office (GPO) Access	http://www.access.gpo.gov/su_docs/
GSA Consumer Information Center (CIC)	http://www.gsa.gov/staff/pa/cic/cic.htm
U.S. Post Office Web Interactive Network of Government Services (WINGS)	http://www.wings.usps.gov/
Internal Revenue Service (Tax Information & Services)	http://www.irs.ustreas.gov/prod/
Income Tax Information Internet Page	http://www2.best.com/~ftmexpat/html/taxsites.html

Central Intelligence Agency (CIA) Publications(World Factbook)
http://www.odci.gov/cia/publications/pubs.html
U.S. State Department Travel Advisories http://www.stolaf.edu/network/travel-advisories.html
FedCenter (Independent I.T. Resource for Federal Government) http://www.fedcenter.com/
Federal News Service (FNS) http://www.fednews.com/
Government Technology Links to Government & Associations http://www.govtech.net/connect.htm
World News Connection (Foreign News Alert - $) http://wnc.fedworld.gov/

State Government - Telecommunication Resources :

The Council of State Governments (CSG) http://www.csg.org/
Energy & Regulatory Matters Information Service (ERMIS) http://ermisweb.state.mi.us/
National Association of Regional Councils (NARC) http://narc.org/narc/index.html
National Assoc.of Regulatory Utility Commissioners (NARUC) http://www.puc.state.tx.us/naruc-hp.htm
National Assoc. of State Information Resource Execs (NASIRE) http://www.state.ky.us/nasire/NASIREmain.html
National Association of State Telecom Directors (NASTD) http://www.csg/nastd.html
National Assoc. of Telecom Officers & Advisors (NATOA) http://www.natoa.org/
National Conference of State Legislatures (NCSL) http://www.ncsl.org/
National Governors Association (NGA) (e-mail - jaykayne@mnsinc.com)
Science and Technology Council of the States (STCS) http://www.csn.net/~pvb/stcs.html
National Regulatory Research Institute (NRRI) http://www.eng.ohio-state.edu/nrri.html
The State (Educational) Networking Project http://www.tenet.edu/snp/
Western Governors Association (WGA) - SmartStates/Virtual University http://www.concerto.com/smart/

Directories of State Government Information:

NASIRE StateSearch http://www.state.ky.us/nasire/NASIREhome.html
State Environmental Regulations (Counterpoint) gopher://gopher.counterpoint.com/
State and Local Government on the Net http://www.webcom.com/~piper/state/states.html
State Legislative and Government Information (ASME) http://www.asmenet.org/gric/states.html
World Wide Web Virtual Library - State Government Servers http://www.law.indiana.edu/law/states.html
Yahoo State Government Indexes http://www.yahoo.com/Government/States/

Telecommunication Industry Trade Associations/Consortiums :

Alliance for Competitive Communications (ACC - RBOCs) http://bell.com/
Ameritech http://www.aads.net/
Bell Atlantic, CyberLibrary http://www.ba.com/ , http://www.bell-atl.com/pages/high/home.html
BellSouth http://www.bst.bls.com/
NYNEX, Interactive Yellow Pages (16.5 million U.S. businesses) http://www.nynex.com/ , http://www.niyp.com/
Pacific Telesis Group (PacTel), Pacific Bell (PacBell) hptp://www.pactel.com/ , http://www.pacbell.com/
SBC Communications (Southwestern Bell) http://www.sbc.com/
US West http://www.uswest.com/
Integrated Services Digital Network (ISDN) http://www.uswest.com/isdn/index.html
!nteract Internet Services http://www.uswest.com/interact/intro.html
Other Telecommunications Policy Issue Sites http://bell.com/sites.html
Alliance for Converging Technologies (ACT) http://www.actnet.com/index.html
American Electronics Association (AEA) http://www.aeanet.org/
Cable Television Laboratories (CableLabs - R&D Consortium) http://www.cablelabs.com/index.html
Cellular Telecommunications Industry Association (CTIA) http://www.wireless-apps.com/ctia/index.html
Commercial Internet eXchange (CIX for ISPs) http://www.cix.org/
Competitive Telecommunications Association (CompTel) http://www.comptel.org/index.html
Competitive Long Distance (CLD) Coalition http://www.cldc.com/
Electronic Industries Association (EIA + Consumer Electronics Mfg. Assoc.-CEMA) http://www.eia.org/
Information Technology Industry Council (ITIC) http://www.itic.org/
Interactive Multimedia Association (IMA) http://www.ima.org/
The Interactive Services Association (ISA) http://www.isa.net/isa/
Project OPEN (Online Public Education Network) http://www.isa.net/project-open/
Intercast Industry Group (Combining TV & Internet on the PC) http://www.intercast.org/

International Communications Industry Association (ICIA w. CIR) http://www.usa.net/icia/
International Telecommunications Union (ITU - CCITT) http://www.itu.ch/
Selected Telecommunications WWW Sites http://www.itu.ch/special/web-sites.html
International Television Association (ITVA w. GreenPages) http://www.itva.org/
Video/Multimedia WWW Sites http://emporium.turnpike.net/I/itva/wwwsites.htm
Multimedia Services Affiliate Forum (MSAF) http://www.msaf.org/
MultiMedia Telecomm Association (MMTA formerly NATA) http://www.mmta.org/
National Association of Broadcasters (NAB) http://www.nab.org/
Library and Information Center http://www.nab.org/www/userguid/libhome.htm
National Electronics Manufacturing Initiative (NEMI) http://www.nemi.org/index.html
National Telephone Cooperative Association (NTCA - Small/Rural) http://www.ltm.com/NTCA/NTCA.html
Organization for the Protection and Advancement of Small Telephone Comapanies (OPASTCO) http://www.assocdata.com/opastco/opastco.html
Satellite Broadcasting and Communications Association (SBCA) http://www.skyreport.com/sbca.htm
Society of Motion Picture & Television Engineers (SMPTE) http://www.smpte.org/
Software Publishers Association (SPA) http://www.spa.org/
(Information Technology &) TeleCommunications Association (TCA) http://www.dfrontiers.com/tca/
Telecommunications Resellers Association (TRA) http://www.tra-dc.org/
United States Telecard Association (USTA - Phonecards) http://hmt.com/ustelecard/index.html
United States Telephone Association (USTA - LECs) http://www.usta.org/
Versit (Interoperability for Convergence of Communications & Computing) http://www.versit.com/index.html
Video Electronics Standards Association (VESA) http://www.vesa.org/
Wireless Cable Association (WCA) International http://www.cais.com/wca/
The Wireless Opportunities Coalition http://wireless.policy.net/wireless/wireless.html

Miscellaneous Telecommunications Vendors:

AT&T, Toll-Free 800 Directory http://www.att.com/ , http://www.tollfree.att.net/dir800/
Bellcore http://www.bellcore.com/
Cox Communications (+ Phoenix Local) http://www.cox.com/ , http://www.phx.cox.com/indexnoframe.htm
DirecTV http://www.directv.com/
LDDS WorldCom http://www.wiltel.com/
MCI , networkMCI Developers Lab http://www.mci.com/ , http://www.mci.com/developerslab/
Sprint http://www.sprint.com/
Telecom Information Clearinghouse (TIC) Companies List http://guess.worldweb.net:80/tpg/tic/tools/toolcomp.htm

Associations, Foundations and Interest Groups :

Alfred P. Sloan Foundation (Science & Technology Philanthropy) http://www.sloan.org./
Alliance for Public Technology (Coalition of Public Interest Groups) http://server.idi.net/apt/
American Civil Liberties Union (ACLU) gopher://aclu.org:6601/
American Communications Association (ACA) http://www.uark.edu/depts/comminfo/www/ACA.html
Telecommunications: Law, Policy and Society http://www.uark.edu/depts/comminfo/www/telecomm.html
Electronic Reference Resources http://www.uark.edu/depts/comminfo/www/reference.html
American Intellectual Property Law Association (AIPLA) http://www.aipla.org/aipla/
American Library Association (ALA) http://www.ala.org/
The Office for Intellectual Freedom http://www.ala.org/oif.html
American National Standards Institute (ANSI) http://www.ansi.org/
Information Infrastructure Standards Panel (IISP) http://www.ansi.org/iisp/iisphome.html
American Society for Information Science (ASIS) http://www.asis.org/home.html
Annenberg Washington Program in Communication Policy Studies http://www.annenberg.nwu.edu/
The Aspen Institute http://www.aspeninst.org/
Association for Computing Machinery (ACM) http://www.acm.org/
Association for Information Systems (AIS) http://www1.pitt.edu/~ais/
Association for Women in Computing (AWC) http://www.halcyon.com/monih/awc.html
Association of Independent Information Professionals (AIIP) http://www.intnet.net/aiip/Welcome.html
Association of Research Libraries (ARL) http://arl.cni.org/
Association of Shareware Professionals (ASP) http://www.asp-shareware.org/
Benton Foundation's Communications Policy Project http://www.cdinet.com/Benton/

Cyber Pages - Telecom & Non-profit Resources http://cdinet.com/cgi-bin/lite/Benton/Cyber/links.html
Universal Service & Universal Access Virtual Library http://www.cdinet.com/Benton/Uniserv/
Berkeley Digital Library SunSITE (Digital Library Clearinghouse) http://sunsite.berkeley.edu/
Digital Libraries Research & Development (D-Lib) http://www.dlib.org/
The Bionomics Institute (Economy-as-Ecosystem Thinking) http://www.bionomics.org/
The Campaign for Broadcast Competition (CBC - Public Airwave Auction Issues) http://campaign.com/
Carnegie Mellon University - NetBill (micropayments) http://www.ini.cmu.edu/netbill/
Electronic Commerce Resources http://www.ini.cmu.edu/NETBILL/commerce.html
The Cato Institute (Nonpartisan Public Policy Research Foundation) http://www.cato.org/
Political and Public Policy Links http://www.cato.org/main/links.html
CAUSE (Assoc. for Managing & Using Info. Resources in Higher Education) http://cause-www.colorado.edu/
The Center for Advanced Study in Telecommunications (CAST) http://express.sbs.ohio-state.edu/cast/
The Center for Civic Networking (CCN) http://www.civic.net:2401/ccn.html
The Civic Network http://www.civic.net:2401/
Local Government Resource Directory http://civic.net/lgnet/directory.html
Telecommunications and Civic Networking Resources
http://www.civic.net:2401/lgnet/telecom.html
The Center for Democracy and Technology (CDT - hosts CIEC) http://www.cdt.org/
Center for Media Education (CME) http://www.access.digex.net/~cme/
The Center for Networked Information Discovery and Retrieval (CNIDR) http://kudzu.cnidr.org/
Center for the New West (Public Policy Research & NIIT) http://www.commerce.com/cnw/
Center for Policy Alternatives http://www.clark.net/pub/cfpa/homepage.html
Centre for Policy Research on Science and Technology(CPROST) http://edie.cprost.sfu.ca/
Center for Strategic and International Studies (CSIS) http://www.csis.org/
Global Information Infrastructure Commission (GIIC) http://www.eds.com/giic/
Center for Telecommunications Research (CTR at Columbia U) http://www.ctr.columbia.edu/
Mobile Computing Resources http://www.mcl.cs.columbia.edu/mobile.html
Center on Information Technology Accommodation (CITA) http://www.gsa.gov/coca/
CICNet (K-12 Connectivity, E-Journal Access) http://www.cic.net/
Rural Datification Project http://www.cic.net/ruraldata/rd-home.html
Citizens Internet Empowerment Coalition (CIEC) http://www.cdt.org/ciec/index.html
Coalition for Networked Information (CNI) gopher://gopher.cni.org/
Colorado Internet Cooperative Association (CICA) http://www.coop.net/coop/
The Computer Museum (Boston, MA) http://www.net.org
Computer Professionals for Social Responsibility (CPSR) http://snyside.sunnyside.com/home/
Computer Systems Policy Project (CSPP) http://www.podesta.com/cspp/index.html
Cross-Industry Working Team (XIWT - NII Architechure) http://www.cnri.reston.va.us:3000/XIWT/public.html
Discovery Institute (Societal Applications of Advanced Technology) http://www.discovery.org/
Educom (IT in Higher Education, Edupage in 10 Languages) http://www.educom.edu/
Electronic Frontier Foundation (EFF) http://www.eff.org/
Electronic Privacy Information Center (EPIC, resource links) http://epic.org/
The Freedom Forum (+ Media Studies Journal) http://199.72.48.16/FreedomForum/
The George Lucas Educational Foundation (w. Edutopia) http://www.glef.org/
Independent Telecommunications Consultants Association(ITCA) http://www.telecomforum.com/itca/
Information Industry Association (IIA) http://www.cqi.com/iia/iia.htm , http://iia.opentext.com/iia.html
Institute for Computer and Telecommunications Systems Policy (ICTSP) http://www.seas.gwu.edu:80/seas/ictsp/
Institute for Global Communications (PeaceNet,EcoNet,ConflictNet,WomensNet,LaborNet) http://www.igc.apc.org/
IGC Issues Index Page http://www.igc.apc.org/igc/issues.html
Institute for Policy Innovation (IPI - Public Policy Think Tank) http://www.ipi.org/
Institute of Electrical and Electronic Engineers (IEEE) http://www.ieee.org/
IEEE Computer Society (w. Computer Magazine) http://www.computer.org/
IEEE USAB TPC CCIP http://www.ieee.org/usab/DOCUMENTS/FORUM/COMMITTEE/ccip.html
Public Policy Links http://www.ieee.org/usab/DOCUMENTS/FORUM/OTHER/other_links.menu.html
International Network of Women in Technology (WITI) http://www.witi.com/
International Standards Organization (ISO) http://www.iso.ch/
International Telecom Center (ITC - Reports & Links) http://www.telematrix.com/toc.html

International Teleconferencing Association (ITCA + Distance Education) http://www.itca.org/
The Internet Engineering Task Force (IETF) http://www.ietf.cnri.reston.va.us/home.html
The Internet Law Task Force (ILTF) http://www.nptn.org/cyber.serv/solon/iltf/index.html
The Internet Society (International Internet Coordination & Standards) http://info.isoc.org/home.html
Investigative & Information Professionals Network (IPN) http://www.ipn.net/
Libraries for the Future (LFF - Advocacy, Use of Technology) http://www.inch.com/~lff/
Morino Institute http://www.morino.org/
MIT Research Program on Communications Policy http://farnsworth.mit.edu/
Intelligent Information Infrastructure Project (AI Laboratory) http://www.ai.mit.edu/projects/iiip/home-page.html
The Media Lab at MIT http://www.media.mit.edu/
Political Participation Project (PPP at AI Laboratory)
http://www.ai.mit.edu/projects/ppp/home.html
National Center for Supercomputing Applications(NCSA/Mosaic) http://www.ncsa.uiuc.edu/
National Computer Security Association (NCSA) http://www.ncsa.com/
The National Distance Learning Center http://www.occ.uky.edu/
National Fraud Information Center (Internet Fraud Watch) http://nfic.inter.net/nfic/
National Information Infrastructure Testbed (NIIT) http://www.niit.org/
National Public Telecomputing Network (NPTN) http://www.nptn.org/
Pacific Telecommunications Council (PTC - Asia-Pacific Focus) http://www.ptc.org/
Project 2000 (Marketing in Computer Mediated Environments) http://www2000.ogsm.vanderbilt.edu/
Project Vote Smart (Political Information Center & Sources) http://www.vot-smart.org/
Election '96 Homepage http://dodo.crown.net/~mpg/election/96.html
Interactive Democracy http://www.cgx.com/id.html
PoliticsUSA http://PoliticsUSA.com/
Progress and Freedom Foundation (PFF - Public Policy Think Tank) http://www.pff.org/
Public Information Access Policy Task Force (PIAPTF - WA) http://olympus.dis.wa.gov/pub/access/access.html
Public Library Association (PLA) http://pla.org/
The Rand Corporation (Public Policy Research & Analysis) http://www.rand.org/
Rural Consumers Coalition for the Advancement of Telecom http://policy.net/rural/
Smart Valley (N. California High Tech Economic Development) http://www.svi.org/
The Society for Electronic Access (SEA) http://www.sea.org/
Society of Competitive Intelligence Professionals (SCIP) http://www.scip.org/
Special Libraries Association (SLA) http://ils.unc.edu/SLA/home/
Taxpayers Assets Project (TAP) & Consumer Project on Technology (CPT) http://www.essential.org/tap/
Tech Corps (K-12 Technology Volunteers) http://www.ustc.org/
Telecommuting Advisory Council (TAC) http://www.telecommute.org/
Town Hall (Conservative Interactive Community) http://www.townhall.com/
U.S. Chamber of Commerce http://www.uschamber.org/
Voters Telecommunications Watch (VTW - Legislative BillWatch) http://www.vtw.org/
World Future Society (WFS) http://www.tmn.com/wfs/wfshome.htm
The World Wide Web Consortium (W3C) http://www.w3.org/pub/WWW/

Publishers & Publications :

General Periodical Access & Journalism Resources:

Broadcast Interview Source(Experts, Authorities, Spokespersons) http://www.yearbook.com/
CIC Electronic Journals Collection http://ejournals.cic.net/
CICNet E-serials Archive gopher://gopher.cic.net:2000/11/e-serials/archive/
Commercial News Services on the Internet http://www.jou.ufl.edu/commres/webjou.htm
Computer and Communications Media Links http://www.cmpcmm.com/cc/media.html
Electronic Newsstand Homepage http://www.enews.com/
E-mail-zines List (Todd Kuipers) http://www.merak.com/~tkuipers/elists/elists.htm
Institute for Alternative Journalism (IAJ AlterNet w. Expert Rolodex) http://www.alternet.org/an/
MediaSource (The Journalists' Information Resource/Media Study) http://www.mediasource.com/index.html
Media Watchdog (w. Resource Links) http://theory.lcs.mit.edu/~mernst/media/
NewsGeek Notebook (Tech News Shop)
http://www.ardemgaz.com/compute/geekmap.htm

NewsLink (Newspapers, Magazines, Broadcast) http://www.newslink.org/menu.html
Newspaper Association of America (NAA) http://www.infi.net/naa/
Newspaper Sources Accessible on the Internet http://mfginfo.com/htm/newspapers.htm
Online Newspaper Services Resource Directory http://www.mediainfo.com/edpub/e-papers.home.page.html
Reporters Committee for Freedom of the Press http://www.rcfp.org/rcfp/
Scoop Cybersleuth's Newsroom Resource Links http://www.evansville.net/courier/scoop/
Society of Professional Journalists (SPJ) http://town.hall.org/places/spj/
World Wide News Sources on the Internet http://www.discover.co.uk/NET/NEWS/news.html

Specific Publishers & Publications:

2600 (The Hacker Quarterly) http://www.2600.com/
Ability Magazine (Health/Disability/Human Potential) http://www.abilitymagazine.com/
Adbusters Magazine (Culture Jammer's Campaign Headquarters) http://www.adbusters.org/adbusters/
Advertising Age http://www.adage.com/
The American Reporter (Newshare Syndicate w. Clickshare) http://newshare.newshare.com/Reporter/
America's Network http://www.advanstar.com/amnet/
Angus TeleManagement Group (Telecom Update, Telemanagement) http://www.angustel.ca/
AT&T Technology Magazine http://www.att.com/att-technology/
Boardwatch Magazine http://www.boardwatch.com/index.htm
BRP Publications (telecom newsletters & reports) http://brpinc.com/index.html
Multimedia Publishing Group http://brpinc.com/data.html
Telecommunications Group http://brpinc.com/telecom.html
Business Week http://www.businessweek.com/index.html
The BYTE Site http://www.byte.com/
Cable Regulation Digest (archive) gopher://gopher.vortex.com:70/11/tv-film-video/cable-reg
Cable World (Media Central) http://www.mediacentral.com/CableWorld
Cahners Publishing (Broadcasting & Cable, Datamation, EDN, http://www.cahners.com/cahners/cahners.htm
Electronic Business, Electronic Packaging & Production, Fiberoptic Product News, Government Computer News, Lasers & Optronics, Research & Development, Scan Tech News, Scientific Computing & Automation, Semiconductor International, Test & Measurement World, Variety, Wireless Design & Development)
Call Center Magazine http://www.callcentermagazine.com/
Campaign & Elections Magazine http://www.infi.net/camelect/
Chilton Company (Cablevision, Communications Engineering & http://www.chiltonco.com/index.htm
Design(CED), Convergence, Electronic Component News, Electronic Industry Telephone Directory, Instrumentation & Automation News, Instrumentation & Control Systems, Product D&D, Quality, Software Solutions, Video Business/Multichannel News/Software, Wireless Week)
CIO Magazine (+ WebMaster) http://www.cio.com/CIO/ciomaghome.html
Cipher(IEEE Computer Technical Comm. on Security & Privacy)
http://www.itd.nrl.navy.mil/ITD/5540/ieee/cipher/
ClariNet (e.News on the Web) http://www.clarinet.com/
CMP's TechWeb (Communications Week, EE Times, http://techweb.cmp.com/
Information Week, Interactive Age (Hot 1000 Companies), NetGuide, Network Computing)
CNN (Cable News Network) Interactive, Financial Network http://www.cnn.com/ , http://www.cnnfn.com/
Communications Industries Report (CIR) http://www.usa.net/icia/cir.htm
Computer (IEEE Computer Society) http://www.computer.org/pubs/computer/computer.htm
Computer-Mediated Communication (CMC) Magazine http://www.rpi.edu/~decemj/cmc/mag/index.html
Computerworld http://www.computerworld.com/
Congressional Quarterly (CQ) gopher://gopher.cqalert.com/,
http://voter96.cqalert.com/
Covert Action Quarterly (CAQ) http://MediaFilter.org/MFF/CAQ_Contents.html
CyberEdge Electric! (Virtual Reality) http://www.cyberedge.com/
CyberSurfer's Webzine (w. Web 100 Underground) http://www.csurfer.com/
Data Communications http://www.data.com/
Datamation (Cahners Publishing) http://www.datamation.com/
Discount Long Distance Digest (Vantek Communications) http://www.webcom.com/~longdist/
The Economist, d.Comm (monthly networking magazine) http://www.economist.com/ ,
http://www.d-comm.com/

Editor & Publisher Interactive http://www.mediainfo.com/edpub/index.html
Educom (Edupage in 10 Languages, Educom Review/Update) http://www.educom.edu/
Environmental News Network (ENN) http://www.enn.com/
E-Tech (Photonics Spectra/Optical Society of America) http://www.osa.org:80/etech/
Federal Communications Law Journal http://www.law.indiana.edu/fclj/
Federal News Service (FNS) http://www.fednews.com/
First Amendment Cyber Tribune (FACT) http://w3.trib.com/FACT/
Flatiron Publishing (Computer Telephony Magazines & Books) http://www.computertelephony.com/
George ("Not just Politics as usual") http://www.georgemag.com/
Government Technology http://www.GOVTECH.net/
INFOBAHN (Magazine of Internet Culture) http://www.postmodern.com/
Information Entrepreneur (Jenkins Group) http://www.traverse.com/smallpress/InfoEntrepreneur/Main.html
Information Today (Mecklermedia) http://www.iworld.com/info2day/it.htm
Infosecurity News http://www.infosecnews.com/isn/MS7.HTML
InfoWorld Electric http://www.infoworld.com/
Institute for Electrical and Electronic Engineers (IEEE) Publications http://www.ieee.org/pubs/pubs.html
IEEE IEE/INSPEC http://www.iee.org.uk/
Intelligence Watch Report (IntelWeb) http://www.awpi.com/IntelWeb/
Interactive Monitor (Media Central) http://www.mediacentral.com/IMonitor
Internaut http://www.zilker.net/users/internaut/index.html
INTERNETWORK (Manager's Magazine of Standards & Interoperability) http://www.btb.com/cardinal/in/
Iway (Connell Communications w. Top 500 Web Sites) http://www.cciweb.com/
Journal of Computer-Mediated Communication http://www.usc.edu/dept/annenberg/journal.html
Jupiter Communications (newsletters & reports on consumer online & interactive tech.) http://www.jup.com/
Law Journal Extra! http://www.ljx.com/
Library Advocate (Libraries for the Future - LFF Newsletter) http://www.inch.com/~lff/services/services.html
Long Distance Digest http://www.wiltel.com/ldd/ldd.html
Mainstream (Magazine of the Able-Disabled) http://www.mainstream-mag.com/
McGraw-Hill Publications (Business Week, BYTE, http://www.mcgraw-hill.com/index.html
Data Communications, LAN Times, Open Computing, UnixWorld Online)
Media Central (Cowles - Cable World, Digital Creativity, Interactive Monitor) http://www.mediacentral.com/
Mecklermedia's iWorld (Internet World, Net Day News, Web Developer/Week) http://www.iworld.com/
Media Studies Journal http://www.persimmon.com/FreedomForum/resources/media_and_soc/msjournal/archive/
Mercury Center (San Jose Mercury News) http://www.sjmercury.com/
MicroTimes (California's Computer Magazine) http://www.microtimes.com/
mmwire Weekly (converging media and technology marketplaces) http://www.mmwire.com/news.html
Mother Jones (The MoJo Wire) http://www.mojones.com/
Multimedia and Entertainment Law Online News http://www.woof.com/melon/
Multimedia World Online http://www.mmworld.com/
The Nando Times http://www.nando.net/
The Net (Imagine Publishing) http://www.thenet-usa.com/
The Network Observer (TNO) http://communication.ucsd.edu/pagre/tno.html
Network World Fusion http://www.nwfusion.com/
NewMedia (Hyperstand) http://www.hyperstand.com/
NewsPage (Individual Inc.) http://www.newspage.com/
The New Republic (Weekly Journal of Opinion) http://www.enews.com/magazines/tnr/
The New York Times http://www.nytimes.com/
Online Access (Red Flash Internet, Inc.) http://www.oamag.com/
Online Inc./Pemberton Press(Online, Database, CD-ROM Professional, MM Schools) gopher://online.lib.uic.edu/
Online User http://www.onlineinc.com/online/
Out Magazine (Gay & Lesbian Issues) http://www.out.com/
PC Graphics & Video http://www.advanstar.com/pcgv/
PC World Online http://www.pcworld.com/
PennWell Publishing (Cabling Installation & Maintenance, http://www.pennwell.com/
Computer Artist, Computer Design, Computer Graphics World, Data Storage, Electronic Publishing,
Laser Focus World, Lightwave, Portable Design, Solid State Technology, Wafer News Confidential)

Penton Publishing (Computer Aided Engineering, EE Product News, Electronic Design, Ergonomic News, Machine Design, Microwaves & RF, Wireless Systems Design) http://www.penton.com/index.html
Phillips Business Information, Inc. (w. Internet Week, newsletters) http://www.phillips.com:3200/
Phrack Magazine http://www.fc.net/phrack/real-index.html
Publish RGB http://www.publish.com/
The Red Herring (Flipside Communications) http://www.herring.com/
Reuters Online (on Yahoo!) http://www.yahoo.com/headlines/current/business/
Satellite Journal International http://www.nmia.com/~roberts/sji/sj300.html
Satellite Times (Grove Enterprises) http://www.grove.net/hmpgst.html
Science Magazine (American Assoc. for the Advancement of Science) http://science-mag.aaas.org/science/
Scientific Computing & Automation http://gordonpub.loyola.edu/
Scrambling News (Cable & Satellite Television) http://www.scramblingnews.com/index.htm
Skeptic Magazine (Skeptics Society) http://www.skeptic.com/
Skeptical Inquirer (Magazine for Science & Reason - CSICOP) http://www.csicop.org/si/
Suck (Web sarcasm) http://www.suck.com/
Technological Horizons in Education (T.H.E.) Journal http://www.thejournal.com/
Technology Review (MIT) http://web.mit.edu/techreview/www/
Telecom Digest (USENET comp.dcom.telecom archive) http://www.wiltel.com/telecom/
The Telecom Daily News (Telecom Forum) http://www.telecomforum.com/telnews.htm
The Telecomm Publishing Group (w. newsletters, Telecom AM, lingo, links) http://guess.worldweb.net/tpg/
Telecommunications Magazine http://www.telecoms-mag.com/
Telecomreg (telecomreg mailing list archive) http://www.wiltel.com/telecomr/telecomr.html
Time Warner's Pathfinder (Entertainment Weekly, Fortune, Kidstuff, Life, Money, People, Time, Sports Access) http://pathfinder.com/
UNIX Review http://www.mfi.com/unixrev/
Upside (w. good resource links) http://www.upside.com/
USA Today http://www.usatoday.com/
U.S. News Online http://www2.USNews.com/usnews/
The Utne Reader (Best of the Alternative Media) http://www.utne.com/
VirtualCity (Guide to Cyberculture) http://www.virtcitnow.com/
Voice of America (VOA) gopher://gopher.voa.gov:70/11/
The Wall Street Journal (Money & Investing Update) http://update.wsj.com/
Washington Researchers (Info Freeway Report + pubs.) http://www.researchers.com/pub/busintel/researchers.html
Washington Telecom Newswire http://www.com/wtn/
Web Review (O'Reilly & Associates/GNN) http://gnn.com/wr/
Websight Magazine (w. Webguide and site reviews) http://websight.com/
Who Cares (Journal of Service and Action) http://www.whocares.org/
Wired - HotFlash/HotWired, The Netizen http://www.hotwired.com/ , http://www.hotwired.com/netizen/
Word (Issues. Culture. A-go-go.) http://www.word.com/index.html
Ziff-Davis Publishing/ZDNet (Computer Gaming/Life/Shopper, Family PC, Inter@ctive Week, Internet Life, PC Computing/Magazine/Week, Mac User/Week, Windows) http://www.zdnet.com/
Z Magazine (A Political Monthly) http://www.lbbs.org/ZMag.htm

Individual Netizens' Home Pages and Web Sites:

Douglas Adams (Hitchhiker's Guide to the Galaxy-Don't Panic!) http://www.shore.net/~caution/douglas/dadams.html
Scott Adams (The Dilbert Zone) http://www.unitedmedia.com/comics/dilbert/
Isaac Asimov http://www.clark.net/pub/edseiler/WWW/asimov_home_page.html
John Perry Barlow http://www.eff.org/homes/barlow.html
Stewart Brand http://www.well.com/user/sbb/
Noam Chomsky Archive http://www.lbbs.org/archive/index.htm
Daniel Dern http://www.dern.com:2205/dernweb.html
Esther Dyson http://www.eff.org/homes/dyson.html
Bill Gates (unofficial) http://www.zpub.com/un/bill/
George Gilder (Telecosm) http://www.discovery.org/gilder/ggindex.htm
Al Gore (U.S. Vice President) http://www.whitehouse.gov/WH/EOP/OVP/html/GORE_Home.html
Peter W. Huber http://khht.com/huber/home.html
Mitch Kapor http://www.kei.com/homepages/mkapor/

Jaron Lanier http://www.well.com/user/jaron/ , http://sun.goddard.edu/~wgdr/kalvos/lanierj.html
Timothy Leary http://www.leary.com/
Steven Levy http://mosaic.echonyc.com/~steven/Steven.Levy.html
Marshal McLuhan http://www.mcluhan.ca/mcluhan/ , http://www.vyne.com/McLuhan/
Marvin Minsky http://www.ai.mit.edu/people/minsky/minsky.html
Nicholas Negroponte http://nicholas.www.media.mit.edu/people/nicholas/
Ted Nelson (Project Xanadu, Sense Media) http://xanadu.net/the.project
Frank Ogden (Dr. Tomorrow) http://www.drtomorrow.com/drtomorrow/index2.html#index
Howard Rheingold http://www.well.com/www/hlr/
Douglas Rushkoff (Cyberia, Media Virus) http://viva.hyperfuzzy.com:2001/82470055617238/rushkoff.html
Bruce Sterling http://riceinfo.rice.edu/projects/RDA/VirtualCity/Sterling/index.html
Clifford Stoll http://www.OCF.Berkeley.EDU/~stoll/ , http://town.hall.org/university/security/stoll/cliff.html
Tom Tomorrow (This Modern World Comics) http://www.well.com/user/tomorrow/
Gary Trudeau (Doonesbury Comics) http://www.doonesbury.com/
Jim Warren (Government Access) http://ivory.lm.com/~tittiger/warren.html
The Website 100 (Most Important & Entertaining People on the Web) http://websight.com/current/ws100/list.html

Subject Oriented Directories:

Telecommunications Related Directories & Resources:

Communications and Telecom WWW Virtual Library http://www.analysys.co.uk/commslib.htm
Computer and Communications Entry Page http://www.cmpcmm.com/cc/
NTIA - Other Telecommunications and Information Sources http://www.ntia.doc.gov/infsites.html
Operation Cyber-Prometheus Telecommunications Resources http://www.odyssee.net/~hex/index.html
Telecom Information Clearinghouse (TPG - Lingo,Links,Tools) http://guess.worldweb.net:80/tpg/pages/guide.htm
Telecom Information Resources (U of MI, extensive) http://www.spp.umich.edu/telecom/telecom-info.html
Telecommunications Resource Directory
http://www.southwire.com/wgta/teledir/teledir.htm
Telecommunications Standards (Ascom)
http://www.tech.ascom.ch/StandardizationService Telecommunications WWW Sites (ITU)
http://www.itu.ch/special/web-sites.html
Telstra (Tele)communications Resources
http://www.telstra.com.au/info/communications.html
Telecom Forum (Worldwide Telecom Directory, Long Distance Comparison) http://www.telecomforum.com/
The TelComLaw Web Page http://www.his.com:80/~rjk/
EPIC Online Guide to Privacy Resources http://epic.org/privacy/privacy_resources_faq.html
ADSL (Asynchronous Digital Subscriber Line) Forum http://www.adsl.com/adsl/home_page.html
ATM (Asychronous Transfer Mode) Forum http://www.atmforum.com/atmforum/home.html
The Ethernet Page http://wwwhost.ots.utexas.edu:80/ethernet/
Dan Kegel's ISDN (Integrated Services Digital Network) Page http://alumni.caltech.edu/~dank/isdn/
North American ISDN Users' Forum (NIUF at NIST) http://www.niuf.nist.gov/misc/niuf.html
Mobile Satellite Telecommunications http://www.wp.com/mcintosh_page_o_stuff/tcomm.html
Robert Smathers Satellite WWW Page http://www.nmia.com/~roberts/robert.html
The Satellite TV (and Radio) Page http://itre.uncecs.edu/misc/sat.html
Prepaid Phonecard Information Resource http://hmt.com/phonecards/index.html
The Tele-M@rket (Telemarket/Call Center w. Buyer's Guide) http://www.syn.net/telemkt/telemkt.html
Electronic Commerce Resources (at CMU)
http://www.ini.cmu.edu/NETBILL/commerce.html
The Electronic Commerce Resource Center (ECRC) http://www.ecrc.ctc.com/
Rutgers University World Wide Web Security Index http://www-ns.rutgers.edu/www-security/
Cryptography, PGP, and Your Privacy (WWW Virtual Library) http://world.std.com/~franl/crypto.html
Cypherpunks Home Page http://www.csua.berkeley.edu/cypherpunks/Home.html
International PGP (Pretty Good Privacy) Home Page http://www.ifi.uio.no/pgp/
Justin's Links from the Underground http://www.links.net/
Silicon Toad's Hacking Resources http://www.rit.edu/~jmb8902/hacking.html
The Underground (No More Secrets) http://underground.org/
The Community Networking Page (University of Michigan) http://www.sils.umich.edu/Community/Community.html

Community Networks (WWW Virtual Library) http://www.rmsd.com/comnet/wwwvl_commnet.html
Freenets & Community Networks (Worldwide Directory/Resources) http://duke.usask.ca/~scottp/free.html
Library-Oriented Mailing Lists & Electronic Serials http://info.lib.uh.edu/liblists/about.htm
Applied Rural Telecommunications Information (AeRie) http://www.yampa.com/aerie/
Rural Clearinghouse for Lifelong Education and Development http://www.ksu.edu/~rcled/
Telemedicine Resources and Services http://naftalab.bus.utexas.edu/nafta-7/tmpage.html
Telemedicine/Rural Medicine Resources http://www.arcade.uiowa.edu/hardin-www/telemed.html
Telecommuting and Telework Info Page http://grove.ufl.edu/~pflewis/commute.html
The Telecommunications Glossary (LDDS WorldCom) http://www.wiltel.com/glossary/glossary.html
PhoNETic (Phone Number to Meaningful Letters/Phrases) http://www.soc.qc.edu:80/phonetic/

General Subject Directories:

Clearinghouse for Subject Resource Guides http://www.lib.umich.edu/chhome.html
Galaxy http://galaxy.einet.net/
IGC Issues Index Page http://www.igc.apc.org/igc/issues.html
iGuide (News Corp. Internet) http://www.iguide.com/index.sml
Library of Congress (LOC) Global Electronic Library http://lcweb.loc.gov/global/globalhp.html
McKinley Group's Magellan http://www.mckinley.com/
Nerd World Media Internet Subject Index http://www.nerdworld.com/index.html
PC/Computing's WebMap (w. Best of the Web) http://www.zdnet.com/pccomp/filters/webmap.html
Rice University Subject Guides http://riceinfo.rice.edu/RiceInfo/Subject.html
Scholarly Societies by Subject http://www.lib.uwaterloo.ca/society/subjects_soc.html
The Whole Internet Catalog http:www.gnn.com/wic/newrescat.toc.html
The World Wide Web Virtual Library http://www.w3.org/hypertext/DataSources/bySubject/Overview.html
Yahoo! http://www.yahoo.com/
Yanoff's Special Internet Connections http://www.w3.org/hypertext/DataSources/Yanoff.html
The YellowPages.com http://theyellowpages.com/default.htm

Geographic Oriented Directories:

Geographic Nameserver (with Zip Codes) http://www.mit.edu:8001/geo
City.Net (worldwide cities on the web) http://www.city.net/
USA CityLink http://banzai.neosoft.com/citylink/default.html
WWW Servers by Geography http://info.cern.ch/hypertext/DataSources/WWW/Servers.html

Travel Resources:

Airlines 800 Phone Numbers & Links (Period.Com) http://www.period.com/airlines/airlines.htm
Bank Credit Cards Info Center (RAM Research Group) http://www.ramresearch.com/choices.html
Business Travel (biztravel.com) http://www.biztravel.com/guide/
Business Travel Library (Craighead Publications) http://www.craighead.com/craighead/
CDC Medical Reference for International Travel http://www.cdc.gov/travel/travel.html
International Travelers Clinic (Medical College of Wisconsin) http://www.intmed.mcw.edu/travel.html
Date & Time Gateway (place/time zone reference) http://www.bsdi.com/date/date
The Eco-Source (ecotourism information & resources) http://www.podi.com/ecosource/
GNN Travelers' Center (w. Whole Internet Catalog Travel) http://gnn.com/gnn/meta/travel/index.html
Travelocity (Power for the Do-it Yourself Traveler) http://www.travelocity.com/
Universal Currency Converter (Xenon Labs) http://www.xe.net/currency/
U.S. State Department Travel Advisories http://www.stolaf.edu/network/travel-advisories.html
U.S. Travel & Tourism Information Network (USTTIN) http://www.usttin.org/
Virtual Tourist (map-based interface to City.Net) http://wings.buffalo.edu/world/vt2/
Weather & Ski Information (NBC News Intellicast) http://www.intellicast.com/
Worldwide Weather (CNN) http://www.cnn.com/WEATHER/index.html

Internet Search Engines:

All-in-One Search Page http://www.albany.net/allinone/
Alta Vista (Digital Equipment Corp. - DEC) http://www.altavista.digital.com/
CUI's W3 Catalog http://cuiwww.unige.ch/w3catalog/
DejaNews Research Service http://www.dejanews.com/forms/dnq.html

Excite (Web, newsgroups)	http://www.excite.com/
IBM infoMarket Service	http://www.infomkt.ibm.com/
Infoseek Guide (Web, newsgroups, FAQs, topics)	http://guide.infoseek.com/
Inktomi	http://inktomi.berkeley.edu/
Lycos (Catalog + A2Z Directory)	http://lycos.cs.cmu.edu/
The MetaCrawler (multi-threaded Web search)	http://metacrawler.cs.washington.edu:8080/home.html
New Rider's Official WWW Yellow Pages	http://www.mcp.com/newriders/wwwyp/index.html
Open Text Index - Simple Search	http://www.opentext.com:8080/omw/f-omw.html
SavvySearch (parallel Internet query engine)	http://www.cs.colostate.edu/~dreiling/smartform.html
Web Crawler	http://www.webcrawler.com/WebCrawler/WebQuery.html
World Wide Web Worm	http://www.cs.colorado.edu/home/mcbryan/WWWW.html

Online Database/Service Vendors:

Consumer Online Services:

America Online (AOL)	http://www.aol.com/
AT&T WorldNet Service	http://www.att.com/worldnet/wis/
CompuServe (CIS), WOW!	http://www.compuserve.com/ , http://www.wow.com/
eWorld (Apple, ceasing operations 3/31/96?)	http://www.eworld.com/
GEnie Online Service	http://www.genie.com/
MCI/NewsCorp (formerly Delphi)	http://www.delphi.com/
Microsoft Network (MSN)	http://www.msn.com/
Prodigy	http://www.prodigy.com/
Online Services Pricing Information	http://www.accessone.com/~shwaap/onlines.html
The List (Internet Service Providers - ISPs)	http://www.thelist.com/

Commercial Database Publishers and Providers:

American Business Information	http://www.abii.com/
AT&T Business Network	http://www.ichange.com/partners/bnet.html
BIOSIS (Biological Abstracts)	http://www.biosis.org/htmls/common/home.html
BRB Publications (Public Records References)	http://www.yab.com/~prrl/main1.html
Britannica Online (Encyclopedia Britannica - $)	http://www.eb.com/
CAB International (intergovernmental scientific publisher)	http://www.cabi.org/
Canada Institute for Scientific and Technical Information(CISTI)	http://www.cisti.nrc.ca/cisti/
CARL Corporation, Uncover (Periodical TOCs)	http://www.carl.org/ , http://www.carl.org/uncover/unchome.html
CDB Infotek (public records)	http://www.cdb.com/
Chemical Abstracts Service (CAS)	http://info.cas.org/
Copyright Clearance Center (CCC) Online	http://www.openmarket.com/copyright/
Derwent Information Ltd. (scientific & patent information)	http://www.derwent.co.uk/
Disclosure Incorporated (Edgar + Public Company Information)	http://www.disclosure.com/
Dow Jones Business Information Services, DowVision	http://bis.dowjones.com/ , http://dowvision.wais.net/
Dun & Bradstreet Information Services	http://www.dbisna.com/
Educational Resources Information Center (ERIC)	http://www.aspensys.com/eric2/welcome.html
Electric Library (Infonautics Corp. - >1K Priodicals - $)	http://www.elibrary.com/
Engineering Information Inc. (Ei Village)	http://www.ei.org/
Find/SVP	http://www.findsvp.com/
Gale Research GaleNet	http://galenet.gale.com/
Information Access Company (IAC)	http://www.iacnet.com/Welcome.html
IEEE IEE/INSPEC	http://www.iee.org.uk/
Institute for Scientific Information (ISI)	http://www.isinet.com/
Knight-Ridder Information (DIALOG, DataStar)	http://www.rs.ch/www/rs/index.htm
Knowledge Express Data Systems (KEDS)	http://www.keds.com/
LEXIS-NEXIS Communication Center	http://www.lexis-nexis.com/
Online Computer Library Center (OCLC)	http://www.oclc.org/
Pierian Press NlightN	http://www.nlightn.com/index.htm
PRNewswire	http://www.prnewswire.com
Profound/M.A.I.D.	http://www.profound.com/, http://www.maid-plc.com/

Public Affairs Information Service (PAIS) http://www1b.inter.net/pais/
Questel/Orbit (France Telecom Group) http://www.questel.orbit.com/patents/, http://www.qpat.com/
Reed Reference Publishing (Bowker, Saur, Marquis, Martindale-Hubbell) http://www.reedref.com/
SilverPlatter World http://www.silverplatter.com/
SIRSI Corporation (VIZION, WebCat, Unicorn) http://www.sirsi.com/
Sociological Abstracts http://www.socabs.org/
Synergistic Technologies Incorporated (STI - High Tech Research Dir.) http://www.netscan.com/sti/index.html
UMI (University Microfilms International) http://www.umi.com/
West Publishing/Westlaw http://www.westpub.com/
H.W. Wilson http://www.hwwilson.com/

Miscellaneous Internet Resources:

CyberAtlas (Internet Research Guide & Statistics) http://www.cyberatlas.com/
Internet Resources List http://www.eit.com/web/netservices.html
The Internet Public Library (IPL) http://ipl.sils.umich.edu/index.html
The Information SuperLibrary (Viacom) http://www.mcp.com/
Listserv Discussion Group Index http://www.tile.net/tile/listserv/index.html
Search for Mailing Lists (Liszt) http://www.liszt.com/
USENET FAQs Index http://www.cis.ohio-state.edu/hypertext/faq/usenet/FAQ-List.html
USENET Newsgroups Index http://www.telstra.com.au/services/news/
The Whole Earth Lectronic Link (WELL - 200 conferences) http://www.well.com/
USBBS (MS-DOS-oriented BBS listings in North America) http://www.channel1.com/usbbs/
Computer User Groups on the WWW http://www.melbpc.org.au/others/index.htm
Jumbo (Official Web Shareware Site) http://www.jumbo.com/
The WinSite Archives (Windows Software - Simtel, CICA +) http://www.winsite.com/
VersionCheck (Software Applications & Hardware Drivers) http://www.versioncheck.com/
inquiry.com (Software Developer's Resources) http://www.inquiry.com/
Webmaster Reference Library (for Developers) http://www.webreference.com/
WELL-tested Web Tools http://www.well.com/WELL_tested/#winaps/
VRML (Virtual Reality Markup Language) Architecture Group (VAG) http://vag.vrml.org/
BABEL - Abbreviation & Acronym Glossary http://www.access.digex.net/~ikind/babel95c.html
The Free On-line Dictionary of Computing http://wfn-shop.princeton.edu/cgi-bin/foldoc
The Jargon File (Ver. 3.2.0 - 3/95) http://www.fwi.uva.nl/~mes/jargon/
Engineering & Scientific Unit Converter
http://www.webcom.com/~legacysy/convert2/convert2.html
History of Science, Technology and Medicine http://www.asap.unimelb.edu.au/hstm/hstm_ove.htm
Netizens: On the History and Impact of Usenet and the Internet http://www.columbia.edu/~hauben/netbook/

Statistical and Demographic Resources:

American Demographics/Marketing Tools http://www.marketingtools.com/
Bureau of the Census (U.S. Dept. of Commerce - DOC) http://www.census.gov/
Bureau of Labor Statistics (U.S. Dept. of Labor) http://stats.bls.gov/blshome.html
Demography Resources (International) http://sosig.ac.uk/Subjects/demog.html
NSF Science Resource Statistics/Studies http://www.nsf.gov:80/sbe/srs/stats.htm
NSF - Other Statistical Resources http://www.nsf.gov:80/sbe/srs/other.htm
Population Studies Center (University of Michigan) http://www.psc.lsa.umich.edu/
WWW Virtual Library - Demography & Population http://coombs.anu.edu.au/ResFacilities/DemographyPage.html

Miscellaneous Internet Directories:

InterNIC Directory and Databases http://www.internic.net/
Four11 White Pages (e-mail & WWW) Directory http://www.four11.com/
AT&T Toll-Free 800 Directory http://www.tollfree.att.net/dir800/
Big Book Directory Search (Yellow Pages) http://www.bigbook.com/
NYNEX Interactive Yellow Pages (16.5 million U.S. businesses) http://www.niyp.com/
Switchboard (Residential & Business Directory) http://www.switchboard.com/
Access Business Online (Business Information Matrix) http://www.clickit.com/touch/home.htm
Business Researcher's Interests (Links to >2500 Sites) http://www.pitt.edu/~malhotra/interest.html
Marketing and Advertising on the Net (Project 2000 Links) http://www2000.ogsm.vanderbilt.edu/links.cgi

The All-Internet Shopping Directory http://www.webcom.com/~tbrown/welcome.html
CommerceNet Directories http://www.commerce.net:80/directories/directories.html
Industry Net (Business Connections) http://www.industry.net/
Open Market's Commercial Sites Index http://www.directory.net/
Public Companies with Home Pages (>830) http://networth.galt.com/www/home/info/insider/publicco.htm
Hoover's Online Company Information http://www.hoovers.com/
Thomas Register of American Manufacturers http://www.thomasregister.com:8000/
Intellectual Property Information Mall http://www.fplc.edu/ipmall.htm#toc
'Lectric Law Library's Rotunda (Lawcopedia & Links) http://www.lectlaw.com/rotu.html
Nolo Press Self-Help Law Center http://gnn.com/bus/nolo/
WWW Virtual Law Library http://www.law.indiana.edu/law/lawindex.html
Professional Association Index (NewMarket Forum) http://www.newmarket-forum.com/
TitleNet (Inforonics, access Publishers' Print Titles) gopher://ns1.infor.com:70/1
HYTELNET Library Access (telnet) http://library.usask.ca/hytelnet/
Public Libraries with Internet Access http://sjcpl.lib.in.us/homepage/PublicLibraries/PublicLibraryServers.html

Non-Profits and Human Rights Groups:

American Civil Liberties Union (ACLU) gopher://aclu.org:6601/
The American Immigration Home Page http://www.bergen.gov/AAST/Projects/Immigration/index.html
Amnesty International Online http://www.io.org/amnesty/overview.html
Electronic Frontier Foundation (EFF) http://www.eff.org/
Human Rights Library & Links (University of Minnesota) http://www.umn.edu/humanrts/
Human Rights Research and Education Centre (University of Ottawa) http://aix1.uottawa.ca:80/~hrrec/
Human Rights Web http://www.traveller.com/~hrweb/hrweb.html`
International Committee of the Red Cross (ICRC) http://www.icrc.ch/
Internet NonProfit Center http://www.human.com/inc/
Internet Resources for NonProfit Public Service Org. http://www.sils.umich.edu/~nesbeitt/nonprofits/nonprofits.html
The Jeffersonian Project (Political Resources) http://www.stardot.com/jefferson/
Meta-Index for Non-Profit Organizations http://www.duke.edu/~ptavern/Pete.meta-index.html
Parliamentary Human Rights Foundation & Global Democracy Network http://www.gdn.org/phrf.html
World Liberalism Homepage http://www.ftech.net/~worldlib/hotspot.htm

Cross-Cultural and Niche Resources:

Aboriginal Resource Links http://www.io.org/~jgcom/aborl.htm
African American Site List (Scott Hill) http://sparrow.accs.howard.edu/staff/scott/african.html
LatinoWeb http://www.catalog.com/favision/latnoweb.htm
NativeWeb (Native American) http://web.maxwell.syr.edu/nativeweb/
Cybergrrl Webstation http://www.cybergrrl.com/
Women's Organizations & Resources (Webwomen!) http://www.tmn.com/otherstuff/women.html
Digital Queers http://www.dq.org/dq/
National Gay & Lesbian Task Force (NGLTF) http://www.ngltf.org/
SeniorNet http://www.seniornet.org/

Medical Resources:

Alternative Medicine Home Page http://www.alternativemedicine.com/
American Medical Association (AMA) http://www.ama-assn.org/
  Medical Science Links http://www.ama-assn.org/med_link/med_link.htm
  Medical Societies Directory http://www.ama-assn.org/directry/directry.htm
Biosciences WWW Links (Harvard University) http://golgi.harvard.edu/biopages/all.html
Centers for Disease Control and Prevention (CDC) http://www.cdc.gov/cdc.html
  Information Network for Public Health Officials (INPHO) http://www.cdc.gov/inpho/inpho.htm
Center on Information Technology Accommodation (CITA) http://www.gsa.gov/coca/
Disability Resources on the Internet http://www.eskimo.com/~jlubin/disabled.html
National Institute on Disability and Rehabilitation Research (NIDRR) http://www.ed.gov/offices/
Food and Nutrition Information Center (FNIC at USDA) http://www.nalusda.gov/fnic/
The Global Health Network http://www.pitt.edu/HOME/GHNet/GHNet.html
The Good Health Web http://www.social.com/health/index.html
HazDat (ATSDR Hazardous Substance Health Effects DB) http://Atsdr1.atsdr.cdc.gov:8080/hazdat.html

HEALTHFINDER (Toll-free numbers for health info)	http://www.nysernet.org/bcic/numbers/NHIC-tollfree.html
Health Care Information Resources	http://www-hsl.mcmaster.ca/tomflem/top.html
HealthGate ($)	http://www.healthgate.com/HealthGate/home.html
HealthSeek	http://www.healthseek.com/
MedAccess (Health & Wellness Information)	http://www.medaccess.com/
Medical Matrix - Internet Clinical Medicine Resources	http://www.kumc.edu:80/mmatrix/
Medical Sites on the Web (Columbia University)	http://www.cpmc.columbia.edu/list.html
Medscape (professional & consumer medical info)	http://www.medscape.com/
Mental Health InfoSource (CME, Inc./Psychiatric Times)	http://www.mhsource.com/
Mental Health Net (MHN)	http://www.cmhc.com/
Modern Healthcare (Weekly Business News)	http://www.modernhealthcare.com/
National Institutes of Health (NIH)	http://www.nih.gov/
National Library of Medicine	http://www.nlm.nih.gov/welcome.html
The National Lesbian and Gay Health Association (NLGHA)	http://www.serve.com/nlgha/index.htm
Pharmacy Resources (WWW Virtual Library)	http://www.cpb.uokhsc.edu/pharmacy/pharmint.html
Primary Care Baseline Project	http://www.med.ufl.edu/medinfo/docs/baseline.html
U.S. Food and Drug Administration (FDA)	http://www.fda.gov/
World Health Organization (WHO)	http://www.who.ch/

UNIVERSAL SERVICE TO UNIVERSAL ACCESS

Appendix D - Universal Service Position Statements

AT&T

Universal Service for Arizona should be defined as the availability and affordability of basic residential local exchange telephone service. Basic residential local exchange telephone services should include:

- A Voice Grade Line
- Touch-tone
- Access to Emergency 911 Service
- White Page Directory listing
- Access to directory assistance
- Access to operator services
- Access to Toll Providers
- Telephone Relay Services (for hearing impaired)

A policy of open local exchange competition, which the Arizona Corporation Commission recently adopted, will enhance the goal of universal service. There is every reason to believe that full and fair competition in the local exchange market will better enhance the goal of universal service than do the entrenched monopolies. In fact, vigorous competition in the local exchange will likely force all competitors – especially the incumbent, Local Exchange Carriers (LECs) – to become more efficient, thereby driving the costs of local service down and making such service more accessible to all consumers.

The same technological and entrepreneurial advances that have made local exchange competition a possibility also have underlined the need for a fundamental redefinition of "universal service" and what is needed to achieve it. While these advances have been made, they are being undermined by the existing system of subsidies, which have a significant negative impact on the development of competition. If LEC monopoly exchange rates are being subsidized by other services, it will be virtually impossible for any new firm to enter the market and compete while the incumbent firm charges prices that are being subsidized. Moreover, any excess subsidies provide LECs with resources that can be used to fend off potential new entrants. There are reasonable and achievable alternatives to the current subsidy mechanism ensuring that all consumers have access to these basic services.

AT&T proposed the preservation of universal service in a competitive environment by the creation of a new national universal service fund managed by a competitively neutral administrator to implement warranted subsidies. The funding would be explicit and subsidies would only be provided to eligible residential subscribers to help pay for basic, tone-signaling local service. The subsidies would be narrowly targeted to households that met specific, need-based eligibility criteria and to those households in certain high cost areas where raising the local rate to fully cover costs would be prohibitive. The explicit subsidy payment would go directly to the carrier serving the eligible customer.

The first step in the reform process is to remove the subsidies inherent in access by pricing access relative to an appropriate measure of cost and determining how the LEC's existing basic services are priced relative to the same measure of cost. If basic service residential rates are found to be priced below cost, then steps should be taken to ensure, over time, that basic rates cover the cost of service, thus eliminating any "built-in" subsidy that today is extended to all customers, irrespective of their ability to pay. Given that competition will spur cost reductions in an industry experiencing declining costs, Commissioners may indeed find that subsidies are not nearly as great as anticipated, and may be eliminated by small increases in local rates without causing undue hardship to those subscribers with the ability to pay.

AT&T (Continued)

Once the built-in subsidies are quantified by service category, Commissioners can determine how much the subsidies can be eliminated by adjusting rates, and what remaining subsidy would be required to obtain their universal service goals. Any remaining need for subsidized rates should be targeted to the residential subscribers or high cost areas meeting eligibility criteria. The goal of this targeted subsidy should be to guarantee that those who cannot afford to purchase telecommunications services in an open and competitive market are given the means to do so no matter where they reside or who the customer selects to provide their local service.

Ideally, a targeted subsidy program should be managed in the same manner as any social program. Under this system, the subsidies would be funded through general tax revenues and then distributed to needy individuals or residents in high cost areas through existing social services channels. If funding is to be provided from industry revenues however, the next best alternative would be to implement a separate, competitively neutral pool. AT&T proposes that funding should be obtained from surcharges on all retail, i.e., end-user customer bills of all providers of telecommunications services. The amount of the subsidy to be recovered by the surcharge should be offset by contributions from LEC unregulated services that have been traditionally contributed to lower local exchange rates (yellow pages).

To avoid the defects of the current interstate system, it is imperative that the mechanism put in place be fair and equitable, easy to administer, economically efficient, competitively neutral and must make subsidies available to all competitors on a fair and non-discriminatory basis.

A further consideration is the joint impact of both national and state universal service plans. The Arizona Commission adopted an Arizona Universal Service Fund (AUSF) several years ago, but has wisely chosen to use the fund only as a safety new to limit rate increases for one high cost LEC, not as a broad funding mechanism. The Arizona Commission's present work looking to update the AUSF to recognize potential competition is appropriate planning for the transition to a competitive market. However, the uncertainty regarding what national plan will be adopted makes the development of a state plan difficult and the possibility of revisions likely.

Arizona Telephone Company

Future Universal Service policy should incorporate the following:

1. The proper **definition** of Universal Service to be mandated must be flexible to encompass those services which now exist and those which will become widely available and broadly utilized by the public in the future. These services need to include for rural areas the medical link and distance learning facilities to provide more medical and educational opportunities in the non-urban areas of the country. The UTS definition should not be limited to basic voice services and should support necessary digitalization of our existing rural network infrastructure to accommodate the National Information Infrastructure.

2. The technology to provide these services in rural areas must be permitted to evolve since provision of the infrastructure for the future cannot be physically or economically provided on a short term basis. Wireless can accomplish much in rural areas but will not be a total replacement for hardwire because of bandwidth and other limitations and because of Arizona's terrain problems. Under the assumption that the end objective will be the provision of an all-broadband national network, it will make sense initially to continue digitalization of the existing network to utilize much of the existing paired copper cable. The implementation and expansion in Integrated Services Digital Network (ISDN) facilities is a prime example. This would permit the transmission on a digital basis of voice, data and video over the same existing copper line, ISDN and other innovative applications can be utilized initially to meet consumer expectations with less costly additions to existing cable plant, especially in the rural areas. It is one thing to pursue rewiring of the Phoenix Valley and Tucson metropolitan areas, but rewiring the rest of the State to serve relatively few residents / businesses in the rural areas is another matter.

3. There must be parity in the quality and quantity of service in the rural versus the urban areas.

4. The price of services must be reasonable and affordable in rural areas and such services must be supported by adequate and properly targeted funding to maintain the universality of such service.

5. Regulators must identify the "provider of last resort" or "essential carrier" for a given service area to ensure that users don't fall between the cracks of competitive providers. Only "providers of last resort" should receive UTS funding because they are the only providers of service to everyone within a given service area. Only regulators can provide the oversight and be the "referee" necessary to make these decisions.

6. Dramatically lower density in the rural areas, and the resulting higher costs to construct and maintain those facilities, require different UTS rules than the urban areas. One rule simply will not fit all areas because the rural markets differ so markedly from the urban markets.

7. Competition traditionally delays entry or avoids many rural areas since sales volumes are not attractive.

Arizona Telephone Company (Continued)

Appropriate UTS policy and funding therefore is essential to a State like Arizona and most other Western States because:

1. Arizona is large geographically but highly urbanized with the great majority of the populations living in the Phoenix and Tucson metropolitan areas. The small towns and rural areas of Arizona must not become "have-nots" in the future world of advanced information services.

2. Due to Arizona's population distribution, U.S. West serves in the magnitude of over 2 million access lines within Arizona, while 9 other Independent (Non-Bell) ECs serve about 140,000. The smaller ECs do not have the economy of scale or capacity to internally average their costs and therefore need UTS support flows to maintain reasonable and affordable rates within their non-metropolitan service areas.

3. Cable TV has not generally penetrated the rural areas within Arizona and therefore does not present an alternative for local service. Therefore, the existing ECs must be relied upon to provide tomorrow's advanced services within rural Arizona.

Call America

Over 60 years ago, Congress passed the Communications Act of 1934 which mandated that every American, regardless of where they live, receive basic telephone service at approximately the same rate. Conceptually, consumers who lived in rural America would pay the same rate for basic telephone service as individuals residing in urban America, regardless of disparities in the cost of supplying such service.

This concept of urban-rural equality, known as "universal service" was based on the demographics of our nation 60 years ago. The subsidy supporting universal service is funded primarily by the long distance industry, who contribute over a billion dollars annually. The National Exchange Carriers Association (NECA) administers the Federal program, collecting fees from long-distance carriers and distributing monthly checks to local exchange carriers. The underlying assumption is that customers care more about basic local rates and that the poor do not use long distance.

The federal system described above has been predicated on rates established by the Federal Communication Commission (FCC) and the States that requires implicit cost shifting by monopoly providers of telephone exchange service through both local rates and access charges to interexchange carriers. To win federal subsidies, local companies file studies showing that their spending per line is at least 15% above the national average. This encourages the LECs to spend freely, inflating the cost of providing local service in order to win subsidy revenue. Companies with fewer than 50,000 customers receive additional money, regardless of the cost of providing basic service.

As we consider how to implement local competition in Arizona, now is the appropriate time for a fresh look at the federal and state universal service system. The belief that a universal service system, designed in the 1930's, is relevant today is preposterous. A complete evaluation must be made of the universal service program, and all of the underlying assumptions on which it is made. I believe that the States, rather than the federal government, are best equipped to provide updated demographic information, reflecting a more realistic picture of the current distribution of customers. Additionally, a neutral third party must administer the system in the future.

The Arizona Corporation Commission should hold public hearings to determine the actual costs of providing local exchange services in each service area. Vertical service profits must not be excluded from this evaluation. Periodic reviews must be made by the Commission, on an ongoing basis to assure that costs assigned to service areas remain relevant and cost based.

The long distance industry supports the philosophy of the universal service and is willing to continue to support it in the future. It is essential, however, that this subsidy be assessed fairly to all telecommunications providers so that the burden is not unfairly assigned to one industry.

Vigorous competition, with its many benefits to the consumer, can only flourish in a free market environment in which entrepreneurs believe they can enter a line of business and make a profit. Since the current telephone subsidy scheme gives all benefits to the incumbent monopoly, the question arises; who would want to compete? Eliminating discrimination will encourage new competitors to enter the market place. With a level playing field, real competition can develop, resulting in lower prices and more options and services for the consumer.

Call America (Continued)

The subsidy awarded for local service must be made available on a non-discriminatory basis to all competitors awarded and controlled by the customer. Unless the subsidy is made available to all competitors, local competition will probably never develop in the rural areas of Arizona.

Resale is the most likely way that competition will first come to the rural and high cost areas of Arizona. This will not happen as resellers are not entitled to the same universal service support that their competitors, the LECs, receive for serving the same customer.

The universal service goal that is contained in existing law could be achieved by instituting a voucher system, insuring that everyone has the ability to receive telephone service at a reasonable rate. Under such a system, a household could use the voucher to pay for any local telephone service they desired, including cellular or satellite communications. Vouchers would be reclaimed for dollars by the local telephone companies selected by the consumer to provide service. The economic viability of companies benefiting from the current subsidy scheme, will be in jeopardy only if their customers seek a new provider. A voucher system recognized merit and choice, rather that a monopoly and an incumbent. Although a voucher system is still a subsidy, it is a much more benign subsidy than the anti-competitive one which currently exists.

I have briefly summarized only a few of the issues and concerns relating to universal service. The federal scheme, which is yet to be defined, may be supplemented by a State universal service program. Additionally, I would like to see the State of Arizona take a proactive role in assisting the federal government in finding common sense, pro-competitive solutions.

I recommend that this complicated task, of evaluating the actual cost of providing local service today, be delegated to the Arizona Corporations Commission and that a rule making procedure be established as soon as possible.

Cox Communications

Cox Communications' interest in the issue of Universal Service in the State of Arizona is derived from two sources. First, as a large telephone rate payer, Cox is interested in the fair and efficient operation of any Universal Service Fund. Second, Cox has an interest in the adoption of competitively neutral rules and obligations because it is a potential provider of competitive local exchange service.

Cox is committed to preserving every consumer's ability to access the public switched telephone network. This commitment is predicated on an equitable funding methodology to maintain access for low income individuals and residents of high cost areas. Universal Service should be limited to "lifeline" basic service to low income customers and high cost areas.

To accomplish the goal of Universal Service, a Universal Service Fund should be established that would provide subsidies to low income customers for "lifeline" service and to high cost areas for the extension of dial tone service. The primary functions of the Universal Service Fund would be to collect and administer funds contributed by all telecommunications carriers in proportion to their net transmission revenues. The fund should be designed as carrier-neutral and funds distributed based on the justified difference between the carriers cost of service and the carriers rates. Only basic local service for residential customers should receive Universal Service support.

The rules of the Universal Service Fund should be designed to decrease that size of the fund over time. In general, the goal of the rules should be to limit subsidies to those cases where service would be uneconomical, not to assure profitability to any carrier or group of carriers. Indeed, as new competitors begin providing universal service, they will reduce the necessary subsidy and, at the same time, force carriers with relatively high costs to increase their efficiency if they want to maintain market share and make a profit. Over time, this process will drive the costs of subsidized services down towards the prices charged in the marketplace, potentially eliminating any subsidies.

Gila River Telecommunications, Inc.

Gila River Telecommunications, Inc. (GRTI) submits the following brief policy statement with respect to Universal Service issues. This statement is submitted in response to the Arizona Governor's Office of Telecommunication Policy (Governor's Office) examination of, and survey about, **Universal Service**. This examination is very timely in that the telecommunications industry is currently undergoing a major transformation. This change will likely result in reliance more on competition to shape this industry than regulation. Moreover, this transformation has thus far proceeded without adequate consideration of the complex and natural tension it presents with respect to maintaining and strengthening Universal Service into the future. This examination is exceedingly important for the State of Arizona because of its extreme differences in service provision challenges between urban centers and vast sparsely populated areas.

1. THE ACHIEVEMENTS OF THE SMALL, LOCALLY OWNED & OPERATED TELEPHONE COMPANIES ARE EXCELLENT EXAMPLES OF SUCCESSFUL **UNIVERSAL SERVICE** POLICY.

The nearly one thousand small and rural telcos exist primarily because a free-market competitive industry of the first half of this century failed to bring quality telecommunications services to many parts of this nation, characterized by high per-subscriber costs and relatively low volumes of traffic. Only after small, locally-owned and operated companies were formed, most with the aid of loans administered by the federal government and all with the aid of joint industry cost recovery plans that make rates viable, did **Universal Service** expand to fill the void left by the large carrier industry.

GRTI is proud of its own experience. GRTI purchased from US West, facilities within the Gila River Indian Community covering a service area of approximately 600 square miles. At the time of acquisition, service was provided to approximately 1,100 subscriber lines. Since that time, GRTI has added some $6 million in cable and wire facilities and $2 million in digital switching. This equipment replaced poor condition buried cable and step-by-step switching equipment. GRTI has deployed fiber optic cable for trunking between offices.

GRTI has extended service without any need for aid to construction charges. Local customers now enjoy single party service, equal access and custom calling features. As such, subscribership has nearly doubled since GRTI acquired the property from the original 1,100 lines to approximately 2,300 lines. The state of small telco quality has been summarized in various forms. For example, the Rural Utilities Service (formerly the Rural Electrification Administration) publishes statistics each year for its large number of small telco borrowers.[1] The National Exchange Carrier Association (NECA) has also published summaries of surveys it has conducted for its member telcos showing the state of network infrastructure and services achieved by the generally smaller telcos.[2] Finally, in recent years there has been a large number of sales of rural exchanges from the larger carriers to smaller ones. State commissions have nearly unanimously promoted these sales because they agreed that the smaller carriers were more likely to provide higher quality of service. [3]

For the past nearly fifty years, the smaller telcos have developed local networks that provide up-to date services in otherwise challenging service territories. This activity resulted in local networks of high quality in those areas served by the smaller locally owned companies. The Governor's Office should study this activity and take note of its success and relevance to the needs of the State of Arizona.

2. **UNIVERSAL SERVICE** ENCOMPASSES A LARGE NUMBER OF RELATED ISSUES.

A definition of Universal Service, and the policies that support it, must recognize an exhaustive list of principles. These principles involve technology, social and economic issues. To assist the Governor's Office, GRTI offers below, guiding principles which should be considered in any Universal Service policy and plan.

Universal Service includes:

a. the availability of equivalent "state of the industry" facilities and services in all areas to all users. Modern telecommunications is so important to everyone's daily business and personal lives that it is incumbent that any Universal Service policy embrace full participation of the network by all citizens;
b. pricing plans that allow inexpensive basic monthly charges that lead to
    i. affordable rates for low income subscribers,
    ii. reasonably comparable rates for the same services,
    iii. all leading to high subscribership penetration levels;
c. policy and industry commitments to extend service to challenging service areas; and
d. policies that provide sufficient incentive to invest in areas that otherwise would be risky telecommunications ventures.

Policy makers could address the first principle in two ways: either by establishing minimum standards for service or the maximum levels of facilities and services beyond which Universal Service policies are not needed. The precise determination of the exact level of services and facilities that lies between these extremes and best balances the economic considerations is difficult. Policy makers should continue with the complex, interactive process involving users, regulators, legislators, telcos and technology experts.

Service standards including when and where to introduce new services or facilities are a complicated matter. Debates over the exact social and economic balance between consumers' expectations and needs, demand, and cost/price results are very difficult to resolve. The proper balance must be dynamic and determined according to local needs.

Small telcos like GRTI stand ready to provide useful, modern, quality telecommunications to our subscribers. We want programs that allow viable cost recovery as backing to this commitment to continue. At the same time, however, we do not want to promote centrally-planned rigid requirements for imprudent investment or services that may outstrip reasonable demand or available revenues.

3. MULTIPLE PROVIDER COMPETITION MAY NOT PROVIDE BENEFITS IN SOME APPLICATIONS.

In the examination of the effect of more competition on Universal Service issues, the Governor's Office should fully recognize that competition, in and of itself, will not serve these objectives. Competition will cause large price de-averaging of services. Targeted, free-entry competitors will confine service to only the lowest cost, highest volume areas forcing current providers to de-average rates to reflect very small area characteristics. This will expose the real cost and price differences between different areas.

Many policy makers do not realize the disparity in pricing that may be unleashed. Data based on averaged cost already indicates that differences vary by more than a factor of 15 to 1 from one location to another. After de-averaging, some estimates project the range to be more like 50 to 1. This de-averaging presents a new challenge to policy makers.

Secondly, policy makers must find ways to balance financial and service responsibilities among different providers to prevent new entrants from only "cream-skimming" the marketplace. Without effective anti-cream skimming provisions, many customers and areas are likely to be harmed by competition.

The marketplace rewards service to only the high volume customers. Without complex requirements and controls, the competitive marketplace will not guarantee the same level of quality to all users. While the industry has historically achieved minimum standards, the new industry will not without new intervention. Furthermore, the competitive marketplace, without further provisions, will make investment in high-cost, low-volume traffic areas highly risky, making commitments to higher quality facilities and advanced information services that users have grown to expect, very difficult. One segment, namely the original carriers, cannot be expected to achieve minimum standards while other segments are free to offer service at prices and quality at will.

With these in mind, policy makers should carefully consider where, and under what conditions, competition should be encouraged and controlled and where it may yet be undesirable. The proper solution to the natural conflict between competition and the preservation of Universal Service will necessarily be more complex than current policies because the solution will need to be applied to an increasing number of very different providers with very different motives.

1. Each year under Information Publication 300-4
2. See NECA summaries entitled "Building the Telecommunications Infrastructure in Rural America" (Nov. 1993) and "Modernizing Rural America—Investments in New Technologies by Small Telephone Companies" (June 1992).
3. These proceedings are all documented in a series of Federal Communications Commission rulings over "study area" changes.

MCI

Basic Universal service for high-cost geographic areas must be defined carefully so that the amount of the necessary subsidy to be funded by telecommunications service providers accurately supports only the provision of basic universal service in high-cost geographic areas for residential customers. There should be no subsidy for business services. Support for business services is more in the nature of economic development rather than support for basic universal service for all households. Basic universal service should be defined as single-line residential access to the first point of switching in a local exchange network, unlimited usage within an exchange area, tough-tone service, white pages listings, and access to 911 service, operator services, directory assistance, and telecommunications relay services.

The amount of support required for basic universal service is calculated as the difference between the economic cost or, what economists call the "total service long run incremental cost" of providing basic universal service, determined separately for relevant geographic support areas using the Benchmark Cost Model that MCI has supported in a recent filing at the Federal Communications Commission and the revenues generated by rates charged. The Benchmark Cost Model was also supported by U S West, NYNEX, and Sprint. The relevant geographic support areas should be high-cost census block groups. Once the amount of the necessary support is determined, revenues for the support of basic universal service must be generated in a "competitively-neutral" manner, through a percentage assessment on the revenues of each telecommunications service provider, net of payments made to other carriers for services that were already subject to the assessment.

Universal service benefits must be distributed in a "provider-neutral" manner to the provider of basic universal service chosen by the residential customer, based on the per-line subsidy requirement identified for each geographic support area. Subsidies must be portable between providers and should be disclosed on customers' bills. Disclosure of this support on customers' bills will allow customers and providers to ensure proper support is being paid and received.

Historically, the universal service subsidy has been funded indirectly, as part of a complex system of direct charges on some customers and above-cost charges for certain local telephone company services (such as access charges and local business rates). These internal subsidies are not devoted solely to universal service goals; rather, they are used to guarantee that the local exchange companies recover their full revenue requirement. The funding of basic universal service be "de-linked" from the incumbent LECs' revenue requirement as soon as possible.

MCI supports some exemptions for small local exchange companies operating in rural areas that may be appropriate for several years initially. However, MCI believes that commissions should review any exemptions authorized within three years to determine whether the exemptions should be modified or eliminated. MCI also believes that commissions must review all universal support mechanisms periodically, at least every three years, to determine if the support mechanisms continue to be appropriate. Programs based upon need, such as lifeline programs and Link-Up America programs, should continue and not be affected by universal support mechanisms which may be necessary for the high-cost geographic support areas discussed above.

SPRINT

Competition and Universal Service. Local service competition enhances universal service. Competition for access services and competition in the local service market may well stimulate the development of new products, stimulate demand and produce higher revenues and earnings for the incumbent local telephone company just as competition in the interLATA long distance market did for AT&T.

Embedded Subsidies Should be Transitioned Away. In order to encourage efficient competition in all market segments, it is important to eliminate uneconomic/non-competitive subsidies embedded in telecommunications pricing structures over a reasonable transition period (e.g., reduce access charges that are prices substantially above costs and raise those rates that are substantially below cost.)

Explicit Subsidies. Subsidies to preserve universal service should have the following characteristics:

- **Explicitly Identified**. If subsidies are required, they should be explicitly identified rather than embedded in various prices;

- **Needs Based Targeting**. If subsidies are required, they should be needs based either on a showing of low income by consumers or based on service to high cost areas;

- **Broad-Based Support**. If subsidies are required, all telecommunications service providers should contribute to such subsidies in a competitively neutral manner based on their telecommunications revenues net of payments to intermediaries;

- **Neutral Administration**. Collection and distribution of subsidies should be done by a neutral administrator;

- **Only Basic Residential Telephone Service Subsidized**. Only basic residential telephone services should be subsidized, limited to (1) single party local service, (2) access to touch tone dialing, (3) access to carriers of choice, (4) access to operator services and, (5) access to emergency (911) services.

- **Competitive Access to Subsidies**. If subsidies are required, then all competitive local telephone service providers should have the opportunity to receive such subsidies when selected by an eligible customer.

Teleport Communications Group (TCG)

Teleport Communications Group (TCG) is the nation's oldest and largest provider of competitive local telecommunications services, with local networks in 21 cities nationwide. Since establishing the competitive local telecommunications industry in 1984, TCG has striven to provide all customers with cost-effective alternatives to the incumbent monopolists. Our initial lines of business were limited by statute or by regulation to dedicated access service. Today, TCG has obtained authority to provide the full range of local exchange telecommunications service in nine states, with applications pending in three others, including Arizona.

TCG has been an active participant in the competition proceedings in Arizona, including the recently concluded universal service workshops initiated by the Arizona Corporation Commission. During those workshops, representatives from a wide range of stakeholders in the future of Arizona's telecommunications industry developed an approach to universal service consistent with the local competition rules approved by the ACC this past summer. The workshop participants recently submitted their proposal to the ACC for its review and we expect the ACC to issue its universal service rules shortly. We welcome this opportunity to share our perspective on this important issue with the Governor's Office of Telecommunications Policy.

No issue has so permeated the reform of the telecommunications industry as universal service has. Whenever policymakers have raised the possibility of introducing competition to previously monopolized segments of the industry, the monopolies have invariably objected to the policy on "universal service grounds." That is, the incumbent local exchange carriers object to any reform that would threaten their monopolies and they raise their objections behind a facade of false concern about the dreadful impact of such reforms on universal service. Universal service concerns were raised when the market for terminal equipment was opened to competition, and again when competition was introduced into the long distance market. During the past decade, as technological change and consumer demand have increased the pressure on policymakers to open the local telecommunications market to competition, incumbent local exchange carriers have once again resorted to "the universal service problem" as a shield to protect their monopolies.

Recent actions by state regulatory commissions, however, indicate that the incumbent local exchange carriers ("ILECS") have cried wolf perhaps once too often. In its draft proposed rule establishing a new universal service program, the California Public Utilities Commission (CPUC) stated that it did:

> ...not agree with Pacific's (Pacific Telesis) position that local exchange competition should be postponed before final universal service rules are in place... Competition will take time. Potential competitors will have to establish their local networks, or enter into agreements with the LECs for access to the local exchange network, both of which are complex issues to resolve. In addition, no studies have been completed that confirm that the LECs' residential basic exchange services are being subsidized by other LED services. By the time competitors are able to make market inroads, and cost studies are completed, redesigned universal service rules will have been adopted.(page 34)

Three points from the above comments are especially noteworthy. First, no evidence yet exists proving that there is a "universal service problem." That is, incumbent LECs have offered nothing more than unsubstantiated assertions that basic local telephone service is subsidized. Second, even if such evidence were produced, competition's limited inroads will pose little threat to the ability of the incumbent local exchange carriers to maintain affordable telephone service throughout their service territories. Finally, the relatively slow development of competition will provide ample time to implement a new, competitively neutral approach to universal service long before the incumbent LECs feel any pressure on their alleged universal service support stream.

These comments by the California PUC were strongly reinforced in a more recent decision by the Washington Utilities and Transportation Commission (WUTC). The WUTC found that:

> ...it will be some time before new entrants have any genuine effect on the revenues of the incumbent LECs... Previous experiences with telecommunications competition have shown that market shares change slowly even when changing providers is relatively easy for consumers, as is the case in the long distance services market. Moreover, it will be difficult for customers to change local exchange providers in the near future. Most will not even have the option, because networks take time to construct. (page 37)

This ruling is not only consistent with the views expressed by the California PUC, but it is also consistent with rulings made by other state commissions. As TCG has grown from a competitive access provider to a full service competitive local exchange carrier, the conclusion of policymakers has been the same: local telecommunications competition does not threaten universal service. Indeed, with proper technical and financial interconnection arrangements, competition will advance the nation's goal of universal service.

As noted earlier, the existence of cross-subsidy support for basic residential service has yet to be proven. If such cross subsidies do exist, however, they, like all cross subsidies, would be unsustainable across competitive markets. To the extent that support is necessary to maintain universal service, therefore, changing market conditions mandate that such support be provided in a competitively neutral manner. To that end, in 1993 TCG proposed Universal Service Assurance, a plan to guarantee that all customer that need support will continue to receive it as competition develops. The fundamental principles of Universal Service Assurance are (1) an explicit fund, independently administered; (2) fair contributions from all providers of two-way telecommunications services; and (3) equal access to the fund by all providers of basic service.

Universal Service Assurance (USA) would replace the current complex system of implicit and explicit intercarrier and intracarrier subsidies with a single, explicit, carrier-neutral support program for individual consumers funded by all telecommunications common carriers. "Equal Access" by all telecommunications carriers to the support program links competition to universal service. By allowing consumers to select any local carrier and still obtain whatever subsidy to which they are entitled, USA makes all consumers "good" customers and encourages many local exchange carriers to compete to attract all customers. USA eliminates marketplace distortions resulting from intercarrier and intracarrier cross subsidies, and assures a flow of subsidies adequate to support basic service. Incumbent carriers that face competition in selected market segments will still be able to serve any subsidized consumer at no more than existing rates and without loss of revenues from those customers. They will be free to lower their prices in competitive markets without endangering support for basic telephone service, and thus will bolster their position in those markets. The fundamental concept of a provider-neutral, carrier-funded universal service fund to which all telecommunications common carriers contribute and from which any carrier providing "universal service" may withdraw has been endorsed with minor variations by many other parties in many forums, including the state legislatures of Vermont and Connecticut, and the National Association of Regulatory Utility Commissioners.

Before any such universal service reform is necessary, however, local telecommunications competition must be legalized and all technical and financial barriers to competition must be removed. Most notable, customers must be able to retain their telephone numbers when they choose another provider for local service, and the financial compensation arrangements between carriers for the exchange of traffic must be economically viable. Only after the removal of such barriers will competitors have the opportunity to bring choice and innovation to the now-captive customers of the monopoly local exchange carriers. Should policy-makers then determine that a support mechanism is necessary to maintain universal service, Universal Service Assurance will remain the proper framework for doing so in a manner consistent with competition.

U S West

Definition: U S West defines universal service as "one-party, voice-grade telephone service with touch-tone capability, equal access to long distance carriers, basic end-user equipment, telephone relay services for hearing- or speech-impaired customers, and dialing access to emergency services and directory assistance."

Support Mechanisms: Any support mechanisms required in assuring universal service provision should be explicitly identified, specifically targeted and funded in a competitively neutral manner.

Low Income / Social Programs: US West supports the continuation of these programs, with all service providers participating in funding them.

High Cost Funds: High cost support should be targeted to the smallest feasible geographic area. US West believes the most reasonable approach to defining the geographic area is the Census Block Group approach, as contained in our comments to the FCC Notice of Inquiry in Universal Service CC Docket No. 80-286. The support would apply, based on the cost of serving a high cost area, regardless of the provider. Any high cost fund adopted should:

- use Census Block Groups as base geographical units;
- ensure uniform methodology in identifying high cost areas;
- provide incentives to ensure efficient service to high cost areas;
- be neutrally applied to any provider of local service.

US West believes any authorized provider who stands ready to provide service to everyone within a Census Block Group should be eligible to receive high cost support based on the number of customers actually served.

Universal Access: US West supports the development of public policies which encourage competing providers to offer advanced communications services to urban and rural communities on an economically-sustainable basis. This may work in concert with a broadening of the universal service definition over time.

MCI, NYNEX, Sprint and U S West

Benchmark Cost Model for Universal Service Subsidies

Executive Summary

On July 13, 1995, the Federal Communications Commission (FCC) issued a Notice of Proposed Rulemaking (NPRM) "...seeking comments on proposals and policy changes to improve...assistance mechanisms intended to provide funds necessary to promote universally available service at reasonable rates." The FCC identified four "primary principles" which should be considered in evaluating any proposals for addressing universal service. These principles provide that a plan should:

1) Be properly targeted so that support is given only to those service providers or users who need assistance to maintain local service.
2) Promote efficient investment and operation.
3) Not impose excessive subsidy costs upon interstate carriers and rate payers.
4) Not impose barriers to competitive entry into local telecommunications.

Elsewhere in the NPRM, the FCC states:

> "We tentatively conclude that Census Block Group is an appropriately-sized geographic area for disaggregating the costs of providing local service... We believe a proposal to use proxy factors to determine distribution of the Fund should receive serious consideration..."

In order that parties commenting in this proceeding may have a common source of data which utilized both the concept of the Census Block Groups (CBGs)[1] and proxy costing, MCI, NYNEX, Sprint, and US West (Joint Sponsors) have worked together to develop a Benchmark Costing Model (BCM). This model will produce "benchmark" costs for the provision of basic telephone service[2] in each CBG within a state. The purpose of this study is to identify those CBGs in which the cost of providing basic telephone service is so high that some form of explicit high-cost support may be necessary as part of a universal service solution. The BCM is intended to provide the Commission, Joint Board, and other interested parties with information that can be used to evaluate the multiple proposals for the use of proxy methods set forth in the NPRM, including assessing the application of the proxy methodology to large companies only.

In developing the BCM, the Joint Sponsors have further developed the previously-submitted proxy models which accounted for density and distance from the nearest central office as factors affecting the cost of service. The Joint Sponsors have also attempted to respond to the FCC's desire to see additional variables which could affect the cost of providing service, such as terrain, slope, surface characteristics, and climate included in the analysis.

The BCM presents monthly cost results using two alternative factors for determining expenses and overhead loadings associated with basic local service. One set of factors is based on historical accounting data, while the second is based on an estimate of costs and overheads using the methodology contained in the MCI/Hatfield study.

In this filing, the Joint Sponsors are presenting a detailed description of the BCM model and the results of this model for six (6) states on which they have completed their analyses (CA, CO, OH, PA, TN, and TX). The Joint Sponsors will not present in this filing any conclusions or policy recommendations which we may draw, individually or collectively from the model results. Each party will be filing its own comments, in which it will state its view on which actions the Joint Board and the FCC should take in addressing the preservation of universal service. In some areas, the Joint Sponsors may agree while in other areas they may disagree on what this data suggests the Joint Board and FCC should do. The Joint Sponsors will, however, make their analysis and policy recommendations from a common set of data.

It is important to understand what the BCM is, and what it is not:

1) The purpose of the BCM is to identify areas where cost of service can reasonable be expected to be so high as to require explicit high cost support for the preservation of universal service.
2) The BCM produces a benchmark cost range for a defined set of basic residential telephone services assuming efficient engineering and design criteria and deployment of current state-of-the-art loop and switching technology, using the current national local exchange network topology.
3) The BCM does not define the actual cost of any telephone company, nor the embedded cost that a company might experience in providing telephone service today. Rather, the BCM provides a benchmark measurement of the relative costs of serving customers residing in given areas, i.e., the CBGs.
4) The BCM included only residential lines in the analysis, because business line source data was not readily available. However, because the primary purpose of the study is to identify high cost CBGs, the impact of excluding business lines from the calculation of the benchmark cost in those CBGs is de minimus.

The Joint Sponsors intend to make copies of the copyrighted model available for use by other parties. By making the model publicly available, the Joint Sponsors hope that the Commission, Joint Board and other interested parties will be able to obtain facts, data, and policy recommendations which will assist in the timely resolution of the important issues relating to universal service.

Summary Model Results

The model results summarized below show the annual benchmark cost and the aggregate support at various illustrative price points, and assuming two different annual cost factor assumptions.

Annual benchmark cost: The actual benchmark cost for each CBG in a particular state is multiplied by the number of households in each CBG. This monthly total benchmark cost for each CBG is multiplied by 12 to yield the annual benchmark cost for each CBG; all CBG benchmark costs in a state are summed to derive the statewide annual benchmark cost.

Aggregate support: The actual benchmark cost for each CBG is compared to illustrative price points of $20, $30, and $40. The difference between the benchmark costs for each CBG that exceeds the illustrative price points and the illustrative price points themselves is multiplied by the number of households in the CBG, and annualized. The result is the aggregate support in excess of the price point(s).

Annual Cost Factors: Annual Cost Factor #1 (31.6765%) is based on historical accounting data and total expense levels of the Tier 1 LECs utilizing 1994 ARMIS Form 43-01. Annual Cost Factor #2 (22.97%) is based on the Hatfield/MCI study approach and reflects limited expense categories and amounts.

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1. A CBG is a geographic unit defined by the Bureau of the Census which contains approximately 400 households.
2. Basic telephone service is defined as voice grade access to the public switched network with the ability to place and receive calls, residential one party service, touch tone, a white pages directory listing (costs not included), and access to directory assistance, operator service, and emergency services, e.g., 911/E911.
3. The Joint Sponsors grant to all parties the right to use the BCM and its results. No right is granted to license or sell the BCM, or any portion thereof, or to reverse engineer or decompile the BCM, or any portion thereof. In addition, except for inputs intended to be modified by the user, no right is granted to modify the BCM, or any portion thereof.

SUMMARY MODEL RESULTS

Six States - Combined	Annual Cost Factor #1	Annual Cost Factor #2
Annual Benchmark cost	$7,231,627,780	$5,243,966,033
Aggregate support		
at $20	$1,930,018,650	$872,141,401
at $30	$1,066,022,818	$467,862,138
at $40	$ 681,695,973	$293,769,835
Average Monthly cost	**$21.37**	**$15.50**
California		
Annual Benchmark cost	$2,252,171,780	$1,633,147,153
Aggregate support		
at $20	$399,861,956	$175,906,571
at $30	$219,697,750	$110,424,413
at $40	$158,057,533	$ 79,592,793
Average Monthly cost	$18.05	$13.09
Colorado		
Annual Benchmark cost	$397,796,384	$288,459,360
Aggregate support		
at $20	$145,584,796	$ 82,500,786
at $30	$107,384,348	$ 61,352,402
at $40	$ 86,837,762	$ 48,949,217
Average Monthly cost	$25.80	$18.71
Ohio		
Annual Benchmark cost	$1,049,913,978	$761,338,029
Aggregate support		
at $20	$263,233,990	$101,837,376
at $30	$115,005,171	$ 28,342,180
at $40	$ 45,063,834	$ 4,825,394
Average Monthly cost	$21.40	$15.52
Pennsylvania		
Annual Benchmark cost	$1,091,050,041	$791,167,567
Aggregate support		
at $20	$268,676,086	$101,534,865
at $30	$111,900,283	$ 27,767,054
at $40	$ 43,619,805	$ 8,154,254
Average Monthly cost	$20.24	$14.67
Tennessee		
Annual Benchmark cost	$606,503,620	$439,802,003
Aggregate support		
at $20	$210,868,030	$ 89,856,583
at $30	$104,685,235	$ 31,546,029
at $40	$ 48,862,492	$ 9,385,469
Average Monthly cost	$27.27	$19.77
Texas		
Annual Benchmark cost	$1,834,191,977	$1,330,051,921
Aggregate support		
at $20	$614,793,792	$320,505,220
at $30	$407,350,031	$208,430,060
at $40	$299,254,547	$142,862,708
Average Monthly cost	$25.14	$18.23

Arizona Cable Television Association (ACTA)

Local service competition enhances universal service. Competition for access services and competition in the local service market may well stimulate the development of new products, stimulate demand and produce higher revenues and earnings for the incumbent local telephone company just as competition in the interLATA long distance market did for AT&T

In order to encourage efficient competition in all market segments, it is important to eliminate uneconomic/non-competitive subsidies embedded in telecommunications pricing structures over a reasonable transition period (e.g., reduce access charges that are prices substantially above costs and raise those rates that are substantially below cost.)

Subsidies to preserve universal service should have the following characteristics:

- If subsidies are required, they should be explicitly identified rather than embedded in various prices;
- Needs based either on a showing of low income by consumers or based on service to high cost areas;
- All telecommunications service providers should contribute to such subsidies in a competitively neutral manner based on their telecommunications revenues net of payments to intermediaries;
- Collection and distribution of subsidies should be done by a neutral administrator;
- Only basic residential telephone services should be subsidized, limited to (1) single party local service, (2) access to touch tone dialing, (3) access to carriers of choice, (4) access to operator services and, (5) access to emergency (911) services.
- All competitive local telephone service providers should have the opportunity to receive such subsidies when selected by an eligible customer.

National Cable Television Association (NCTA)

ISSUE: What measures should be taken to support the universal availability of basic local phone service in a competitive telecommunications environment, and what providers should be eligible to deliver universal services?

NCTA Position: All competitors in the local telecommunications market should pay their share, to the extent necessary, of the cost of ensuring that basic telephone service is available to all Americans. Universal service subsidy funds should be made available to any provider of local telecommunications service that is willing to deliver universal service.

Background: Basic telephone service is an essential service, and subsidies may be necessary to ensure that it remains affordable to low income and rural subscribers. Regulators established a "universal service fund" in the aftermath of AT&T's divestiture in order to ensure that the support of affordable phone service was equitably distributed among all long distance companies. A similar model has been proposed for a competitive local telephone marketplace.

Arguments:

- Local competition will promote universal service policies by driving down prices and affording consumers greater choice among providers.
- In a competitive marketplace, cable companies and others who become providers of telecommunications services have a corresponding responsibility to contribute to the maintenance of universal service. The cable industry understands and accepts this responsibility.
- All providers that are willing to deliver universal service should have access to the subsidy fund to which they contribute.

Recommended Action:

Telecommunications legislation should:

- Require that competitors in the local telecommunications market, to the extent necessary, pay a fair share of the cost of universal service;
- Make universal service subsidy funds available to any provider that is willing to deliver universal service;
- Define universal service as basic touch tone service, and permit later redefinition if it is made necessary by the market-based adoption of additional services.
- Require that the amount necessary to support universal service be carefully calculated to avoid imposing unnecessary burdens on consumers and jeopardizing the growth of competition.

National Rural Telecom Association (NRTA)

Universal Service

Universal Service is a bedrock principle of federal and state telecommunications policy. It recognized that all Americans need access to telephone services on an advancing network. It also embodies the economic theory of "external benefits." This theory rests on the understanding that access to a nationwide modern telecommunications network and service has an increased value of all subscribers with each new subscriber or user. Since the external benefits exceed what each individual would pay for his own benefit, it is sound public policy to provide access that will cause as many subscribers as possible to connect to and use the public switched network.

The Clinton Administration, Congress, many states and many regulators favor a universally available National Information Infrastructure. Participation in the national and global economies will require universal access to an information-rich telecommunications infrastructure and services.

The universal service policy is of particular importance in rural areas where low population density and fewer businesses and lower traffic volume result in higher unit costs. Stand-alone rates for some rural service could increase by up to $100 a month or more over current rates. Rural Utilities Service (formerly REA) and Rural Telephone Bank loan programs, together with various internal averaging mechanisms and explicit state and federal cost recovery programs have made possible affordable rates and up-to-date network capabilities in high cost areas. Spreading above average costs over the entire network means that customers in low cost areas pay a tiny increment over the stand-alone costs to save high cost area customers tens or hundreds of dollars per month in local rates. This policy is fair because *all users* benefit from the nationwide communication and information infrastructure. Rates for interstate and state long distance services that are averaged nationally and statewide have also supported national unity and economic growth.

High cost rural areas can benefit from using advancing telecommunications technology to provide education, health, social services and economic development opportunities to isolated, often economically disadvantaged rural communities. The U.S. communications network leads the world and offers virtually all locations in our nation affordable and evolving facilities and services. It is RUS-RTB financing, the universal service policy and various cost sharing mechanisms that have made this rich national resource a reality – not the "marketplace."

The trend towards relying on competition rather than the traditional regulated single source model is placing our nationwide, affordable, advancing infrastructure and service in jeopardy. Cost sharing becomes increasingly difficult when the below cost and average cost areas that help sustain affordable service in the high cost areas served by the traditional universal obligated to provide or support universal service.

National Rural Telecom Association (NRTA) (Continued)

Congress is currently considering legislation which proposes to update the nation's universal service and competitive policies. Proposals so far have agreed that *rural and urban rates and services must be reasonably comparable*. They look towards requiring more telecommunications providers to share the costs of high cost service. In this way, all end users will help support the nation's valuable public switched telecommunications infrastructure and the support mechanism will not cause uneconomic entry. However, some extreme economic theorists argue that the competitive marketplace should govern the availability and price of service in high costs areas. They ignore the lessons of the past and – that the competitive marketplace neglects rural areas and causes an increasing rural-urban communications and information gap. Others argue that many providers should be supported, even if it leads to artificial "competition" between two or more propped-up carriers in a rural market that cannot support one stand-alone, marketplace driven network.

The FCC and a Federal-State Joint Board are looking at ways to revamp some nationwide universal service programs. Unfortunately, their apparent goal is to limit and reduce high cost sharing mechanisms. With the information epoch underway, it is harsh and mistaken anti-rural public policy to stifle rural infrastructure and service advances.

Instead, Congress should reaffirm and update the nation's universal service commitment to all consumers, businesses and communities. It should direct a Federal-State Joint Board to develop efficient, adequate and sustainable mechanisms to enable a carrier with universal service and carrier of last resort obligations to preserve and promote rural participation in the nationwide, affordable public telecommunications infrastructure.

National Telephone Cooperative Association (NTCA)

Universal Service means the availability of modern telecommunications services to all portions of the country at reasonable rates. Universal Service has been virtually achieved in the areas served by small and rural companies, and to a somewhat lesser degree in the areas of the larger companies. This success has been achieved as a result of the fortuitous mixture of the following elements:

- An efficient and effective federal loan program which made capital and expertise available to persons willing to provide service in areas not attractive to the large carriers.
- Jurisdictional cost allocation formulas which ensured that rural companies received an adequate share of the toll revenues generated by their subscribers.
- Dedication and commitment of the owners and managers of rural telephone companies to their communities and their skill in meeting the challenges of low density and general lack of large, high-volume customers.
- In the case of the large companies, the use of broad averaging of costs and prices to maintain reasonable rates in high cost areas.

This success has been achieved in an environment where in which only a single carrier provided service. Generally, the right to serve an area, or the use of government loan funds, obligated the carrier to serve all applicants without discrimination.

Now, the environment is changing rapidly and new entities are receiving authorization to provide competing services in the areas of their choosing. This change has been heartily endorsed by the federal and many state governments on the assumption that competition will produce net consumer benefits through greater efficiency. While this assumption is based on experience in other parts of the economy, and even of the telecommunications industry, it remains to be seen whether the residential and small business customers located in low density, high cost areas will continue to receive service under the conditions being advocated today.

The closest analogy may be the transportation field. When long haul trucks began competing with railroads, the government tried to manage competition by complex rules, which ultimately contributed significantly to the near demise of the railroads. When deregulation came to the airline industry, the unequivocal result was that service declined substantially for many rural areas. Economists argue that this is the correct result, but if the same purely market dictated result is in store for rural telephone users, it is incumbent upon the government to so advise the public so that it can react accordingly.

The central issue is, of course, how one entity can afford to continue serving both high and low density and high and low volume customers, while competing with a multitude of others who have no inclination to serve any customers except the high density and high volume users? The few attempts to respond to this dilemma are impractical and unrealistic. One position is that faced with competition, the incumbents will become more efficient and find ways to reduce the cost of serving low volume customers in low density areas, such as use of wireless technologies. Another is that competitors will come to rural areas as soon as they are provided with the "subsidies" that allow the incumbents to maintain their prices below the costs of a new entrant.

National Telephone Cooperative Association (NTCA) (Continued)

The first argument ignores the fact rural telephone companies necessarily use the most efficient technologies available, including wireless loops where appropriate, but the vast distances and other obstacles impose an unavoidable additional cost burden. No proponent of this theory has made a realistic showing that it could provide equivalent service more efficiently. The second argument is also made repeatedly, but without documentation or explanation. The simple fact is that none of the new competitors are clamoring to serve the non urban areas of any state, much less Arizona where densities are orders of magnitude lower than in the cities, whether or not there is a "subsidy" available.

Consider the claim that rural telephone companies are subsidized. This issue generally arises in the context of the jurisdictional cost allocation formulas prescribed by the Federal Communications Commission. These rules merely prescribe what proportion of a telephone company's total cost (investment and expense) may be recovered in charges for interstate use of a plant that is used for both inter and intrastate services. These rules are only of significance to a rate regulated entity. All other businesses make their own decisions as to how to recover the common costs of providing multiple services, but government regulators make this business decision for telephone companies.

The FCC rules prescribe a higher interstate proportion of cost for small telephone companies, and those with above average cost of service with the result that these companies have a lower proportion of their cost to recover through intrastate charges, especially local service. This is no welfare program, it is merely a cost recovery plan with no right to recover more than 100% of cost. In the absence of these cost allocation rules, local service rates in rural areas would be excessive and investment would not be made to provide service.

Change in historic industry practice must come, however, if universal service is to survive. One unavoidable fact is that incumbent telephone companies must be allowed to compete for the few customers they have that will be attractive to a competitor. The second fact is that by doing so, prices will necessarily rise for the average customer for whom competitive alternatives will not be likely. The proponents of unrestrained local competition hope to ignore this reality until it can be blamed on someone else. But like the fact that in small towns, air transportation costs more for lower quality service, telephone service will necessarily follow a similar path if the results are determined solely by the "market".

In a recent speech, Chairman Reed Hundt stated what he saw as the FCC's twin mission: private competition in communications, public benefit from communications. He went on to say that the Commission should "represent the public interest where competition won't deliver all the socially desirable benefits of the communications revolution." The State of Arizona similarly should recognize that rural telephone service will not continue to be universally available if the result is left solely to the market.

The Organization for the Protection and Advancement of Small Telephone Companies (OPASTCO)

OPASTCO firmly believes in the universal service concept. OPASTCO believes that the goals and definition of universal service are constantly evolving. Obviously, communications services today are different than those in 1934. In the information age, this concept is even more important. Universal service should include access to advanced telecommunications services beyond simple voice grade standards. A seamless, modern information infrastructure, in urban and rural areas is crucial to universal service.

Policy makers have also stressed that the telecommunications infrastructure must be deployed in such a way that it avoids the creation of information "haves" and "have nots." OPASTCO believes this is entirely consistent with the definition of universal service. As advances in technology and burgeoning competition change the telecommunications marketplace, the concept of universal service must be strengthened and constantly evolving if the vision of a truly ubiquitous network is to be realized.

Today, almost 94 percent of U.S. households have telephone service. This high penetration rate is made possible by several different state and federal programs and policies that keep telephone rates reasonable, regardless of household income or geographical location. The recent .4 percent drop in subscribership demonstrates the need and difficulty of attaining even adequate penetration, let alone the provision of universal service. Any changes to the current USF mechanisms could have the potential of jeopardizing universal service goals.

The current USF mechanisms allow high cost, rural networks to be built, enabling new subscribers to connect to the vital network. The Universal Service Fund helps telephone companies serve high-cost areas by allocating a portion of these costs to the interstate jurisdiction. Costs are higher in rural areas than in urban and suburban areas because telephone companies have to install more physical plant, covering greater distances, in order to reach fewer people. Therefore, the per subscriber cost can be much higher. Because rural markets contain fewer large customers, such as businesses, the loss of a small number of those customers to a competitive provider will increase the rates for the remaining users. Accordingly, USF support should only flow to the provider that has the obligation to serve all customers, not just the most profitable ones.

OPASTCO has long supported the Lifeline and LinkUp America programs that enable low-income subscribers to connect to the network. Lifeline is a program through which qualified low-income subscribers can have their $3.50 a month subscriber line charge (SLC) waived. LinkUp America allows low-income customers to receive a reduced installation charge, facilitating network access and increasing penetration. These two programs work in tandem with the USF. While the USF helps extend service in rural areas and construct the network, Lifeline and LinkUp America give low-income subscribers the means to connect.

OPASTCO believes that these mechanisms are vitally important to not only the direct recipients, but also the nation as a whole. Each new subscriber added to the network adds to the value of the network by expanding the number of U.S. citizens, businesses, and educational and governmental institutions that can be reached by every other telephone subscriber. It is essential that telecommunications legislation or FCC decisions continue to support universal service for all Americans, including those in rural America, so they are guaranteed access to quality, advanced telecommunications services at reasonable rates. The United States has the most advanced and extensive telecommunications network in the world today due to this commitment to universal service. The USF is an integral part of this success.

United States Telephone Association (USTA)

America is at a cross-roads in telecommunications: seeking to expand competitive advanced telecommunications and information choices for as many consumers as possible, while at the same time seeking to maintain a historic commitment and support to provide services to all consumers. This commitment to universal service consists of two key components: availability and affordability. USTA applauds the dedicated work and comprehensive proposals put forth by the Administration, Congress, the FCC, state regulators, and others. USTA agrees with many of these proposals that a comprehensive, national proceeding to address universal service is necessary in order to meet customer and universal service requirements as competition is introduced and the information super-highway is deployed.

Regulatory paradigms of the past were designed to promote universal telephone services to all citizens through a package of inter-dependent policy tools. These tools included holding rates for some services below market levels in many areas; the creation of explicit support mechanisms; internal support flows, and; carrier of last resort obligations within exclusive franchises. With these regulatory tools, which were part of a form of social contract between regulators and the telecommunications industry, America's local exchange carriers (LECs) have successfully achieved an average penetration level of over 94%, although penetration to certain segments of society must still be addressed.

The existing package of regulatory tools is no longer sustainable in today's rapidly evolving telecommunications markets. While existing tools may be adjusted or supplemented in some markets, a transition to new mechanisms and a new regulatory paradigm needs to be developed and tested in many markets. Current social contracts are no longer feasible, or, in many cases, desirable. Competitive barriers have fallen through numerous technological and regulatory changes. America is at the threshold of a new era.

It is essential for America to adopt a dynamic, forward-looking telecommunications policy. The Universal Service policy vision should promote the continued widespread availability of telecommunications services throughout the United States and universal accessibility to the advanced information superhighway. Wherever possible, this development should be determined by the forces of the competitive market, which will ensure that services are responsive to customers' needs, and that investment in America's telecommunications infrastructure will be made efficiently. Where the market cannot be relied upon, universal service policy should continue to ensure that the benefits of the telecommunications super-highway are available to all citizens.

The Hallmarks of the USTA Universal Service Policy Are:

- **Reliance on Market Forces**, wherever feasible, to establish reasonable prices and guide the development of new services;
- **Availability** of universal services to all consumers;
- **Periodic Review** of services included as part of the Universal Service policy vision;
- **Deployment** of additional telecommunications and information services to schools, libraries, hospitals, and citizens with disabilities;
- **Affordability** of targeted services;
- **Incentives** for full participation by all providers in an increasingly competitive telecommunications market;
- **Funding** universal service obligations in a competitively neutral manner; and
- **Ubiquity** through market-driven infrastructure deployment and carrier of last resort obligations where required.

These key objectives will ensure that the policy vision of universal service - universal accessibility to the advanced information super-highway - will be met in the 21st century.

Western Alliance

Telecommunications: A Rural Agenda

The Western Alliance recommends that federal telecommunications legislation and any federal or state regulatory changes incorporate the following principles:

Universal Service:

A dynamic, evolving concept driven largely by technology with geographically averaged toll rates and compatible rural and metro local service and rates. Affordable universal service should be maintained where it presently exists, extended to where it does not exist, and be periodically reviewed for expanding the definition. What is basic and advanced service today will not be in the future. The marketplace in metro areas, not government, should in most cases drive the evolving definition.

Specifically, universal service should include at least voice grade access to the public switched network, broadband capabilities on demand, single party touch-tone service, a white page listing, and access to operator, directory, and emergency services.

Continued use of a regulated, evolved monopoly model in rural areas will continue to maximize the efficiencies where possible, thereby benefiting all users. Although it may appear "politically incorrect" to speak against the entry to competition in the telephone business at a time when many have accepted the idea, we believe competition in rural area markets may not serve the public interest.

Universal Service Funding:

The national commitment to universal service requires adequate support mechanisms implemented through nationwide cost allocation and cost recovery mechanisms. These mechanisms should apply only to the facilities-based universal service provider of last resort, service customers in low-density rural areas. The benefits of universal funding flow directly to the customers in the form of lower monthly rates. If national universal service policy requires upgrades to the public network or preferential rates for public facilities such as schools, libraries and the like, local exchange carriers must be able to recover the costs not recovered through affordable rates paid by such public entities from universal service support mechanisms.

All telecommunications providers should contribute to a universal support mechanism fund on an equitable, non-discriminatory basis. Consideration should be given to using revenue or minutes of use as the basis of payment.

Current Lifeline and Linkup support programs for low-income households should remain available and separate from high-cost assistance.

Western Alliance (Continued)

Infrastructure:

Any local exchange carrier must be required to allow a local exchange carrier serving as the carrier of last resort in any neighboring area lacking economies of scale or scope to share, on request, its public switched network infrastructure and services for the benefit of the customers of the carrier of last resort.

A rural telephone company must not be required to provide expanded interconnection, equal access or unbundled charges, unless the FCC shall have determined that application of any such requirement would be fair, not unduly burdensome and consistent with the public interest.

Local Exchange Carriers should not be left with stranded investments by newcomers that "cherry pick" their profitable customers, leaving them with unrecovered costs.

State regulators must retain adequate authority in rural areas to preserve and advance universal service when determining whether specific competitive entries are in the best interest of rural America.

Modified Final Judgment (MFJ):

The MFJ restrictions on RBOC interexchange services must not be lifted unless adequate rural safeguards are adopted to protect rural LECs and their customers from both geographical toll - rate deaveraging by an interexchange provider and selective bypass. Nor should rural telephone companies become subject to obligations imposed upon RBOCs because of the MFJ.

Rural Definition:

Rural telephone companies must be defined as local exchange carriers serving predominantly rural areas as the carrier of last resort. Rural telcos serve low density areas, and short-haul toll must be factored in when comparing local rate levels.

The Western Alliance's primary focus for the FCC NOI filing was on behalf of the "small of the small", wherein we identified companies with 20,000 or less access lines as needing support due to their exposure and vulnerability to significant change. Proposals to limit or exclude from funding exchange carriers based on size or form of regulation need careful study to better understand the consequences for rural customers.

In Summary:

Local exchange carriers responsible for providing service to predominantly rural areas require an evolving definition of universal service – a process that monitors and ensure that rural markets can support competition, a continuation of the highly successful high-cost recovery mechanisms, local and long-distance rate comparability between rural and urban customers, and mandatory infrastructure sharing when requested by the carrier of last resort.

American Library Association (ALA)

Equity on the Information Superhighway

The American Library Association (ALA) endorses the national goal of connecting all schools, libraries and hospitals to the information superhighway by the year 2000.

Libraries are charged with ensuring public access to a diversity of information sources and viewpoints, regardless of a user's economic status of information-seeking skills. That public missions is essential to a democratic society and it cannot be filled solely by the commercial sector. At a time when only one of three American households owns a computer, our nation's public, school and college libraries are uniquely positioned to serve as the public's on-ramp to the information superhighway – a place where all people can tap into new technology with the expert assistance of a librarian.

What is needed to ensure full participation by libraries?

- Online connections must be of the quality and speed to allow access to information in all formats (this means Internet in the short term and much higher speeds in the near future).

- These connections must enable libraries to create databases as well as library resources and services available to distant users and other libraries. There must also be support for libraries in converting their resources to digital formats.

- Telecommunications rates for libraries and educational institutions should be stable, predictable and affordable regardless of geographic location.

- There must be public policies that recognize the privacy of individuals and the importance of open access to information in an electronic environment.

- There must be support for purchase of equipment and training to ensure that all libraries have the technology and knowledgeable personnel to assist the public in using this new technology.

Arizona Consumers Council

Principles to Ensure Basic Service and Protect Consumers in the Information Age

Ensure Affordability of Basic Service

A. Preserving Universal Service for the Vast Majority
   1. Universal Service depends on a fundamental commitment to affordable pricing based on just and reasonable rates for all households.
   2. All users of the network should pay for all elements of the network that they use in proportion to the nature of the demands that they place on the network.
   3. The burden of joint and common costs placed on basic access should be minimized.

B. Meeting the Needs of Underserved Groups
   4. Lifeline programs must be expanded and improved.
   5. We must have explicit commitments to make the information age accessible to all citizens, regardless of their functional abilities.
   6. We must assure that a reasonable level of technology is available across all geographic areas of the country as the information age evolves.

Expand the Definition of Basic Service

A. Modernizing Basic Service
   7. Basic telecommunications service must include access to available digital service with full interconnectivity to all networks at affordable rates, subject to the constraints of efficiency and affordability.
   8. At a minimum, expanding the concept of basic service must not raise the price of basic service; in fact, it must be reasonably likely that it will lower the price of basic service by lowering costs or increasing revenues.

B. Public Goods on the Public Switched Network
   9. To be included in basic service new elements must be communications services which connect each to all and possess characteristics of telecommunications public goods.
   10. The needs and preferences of all users must be considered in open, public forums.

Promote Open Networks and Effective Competition

A. An Open Network
   11. Interconnect all networks ensuring open communications of each-to-each and any-to-all (the functional equivalent of common carriage).

B. Promoting Competition
   12. Competition must exist before deregulation – it does not exist today.
   13. Competition must be promoted through the elimination of advantages enjoyed by continuing market power over the local network.
   14. Competition means multiple suppliers for significant numbers of subscribers with significant numbers of subscribers having taken alternative service.

Arizona Consumers Council (Continued)

15. Entry into telecommunications network related lines of business (video, information services, manufacturing and long distance) by local telephone companies requires mitigation of market power and effective regulation of affiliates prior to entry.

Enhance Consumer Privacy

A. Proprietary Information

16. Telephone subscribers must have the right to keep private their telephone numbers and usage patterns.
17. Local exchange carriers must not use proprietary customer information to market non-basic services. Affirmative authorization of the subscriber must be obtained for any use of such information.

Provide for Effective Regulation

A. Structure

18. Strong structural safeguards including completely separate subsidiaries, strict rules governing affiliate transaction, and limits on ownership must be imposed for all major lines of business (information services, video, manufacturing, and long distance).
19. Adequate regulatory authority must be ensured at the state and federal levels including access to books and records, penalties for anti-consumer and anti-competitive behavior, and adequate funding for regulatory staff and consumer intervenors.

B. The States

20. States must be given flexibility in managing the transition to competition.

Arizona Department of Education (DOE)

Equality of access to information within the educational community is critical to supporting Lisa Graham's vision of *Assess to Extraordinary Education*. Information provided to the public about how our schools spend taxpayer dollars, how our students are performing academically and how much debt has been incurred to pay for our schools ensure that all members of the community have the ability to participate in improving education for Arizona's students.

The most efficient and effective way to collect that information is via the Internet. The most efficient and effective way to provide that information is through the Internet. In addition, giving schools access to the Internet also creates a wonderful opportunity for enhancing classroom curriculum. The value of the Internet as a curriculum tool is just beginning to be understood.

Therefore, it is a critical goal at the Arizona Department of Education (ADE) to connect all schools, districts and the ADE to each other through the Internet.

We believe the best way to provide this connectivity is through partnerships with universities, community colleges, local consortiums, businesses, utilities, state agencies and local, statewide and national telecommunications providers. The procurement of equal access to reasonably priced, reliable service in rural areas will be crucial to the success of this effort. Issues such as fixed costs for basic bandwidth and equal access to support services must be considered. In addition, artificial boundaries must be removed so that transport of information moves in logical organizational patterns. For example, universities should be allowed to provide schools with access to their telecommunications devices.

The most difficult part of our effort to connect schools is to bring together all of the necessary entities to establish partnerships for connectivity. If we can create a model of cooperation that can be used throughout the state, this would greatly expedite the process.

Arizona Department of Library, Archives and Public Records (DLAPR)

Recent developments in the world of telecommunications are bringing libraries into the forefront of the information age. The availability of electronic information is challenging libraries to expand their role in a more efficient and broad based manner to provide worldwide resources to all citizens. Libraries can only provide these resources if they have access to clean telephone lines and if the line rates are affordable.

It is essential that every community have basic telephone service that includes clean, reliable voice grade telephone lines. Service to all communities must include analog (dial tone) and digital (data) lines. Along with the availability of basic service, it is critical that libraries be given a preferential telephone line rate in order to ensure that libraries will continue to provide information to Arizona's citizens. Additionally, a network that would provide access to electronic resources through a local telephone call would help to ensure equal access to information.

Libraries are committed to serving all citizens, regardless of place of residence or economic status. Citizens with better access to information have opportunities to enhance their lives, contribute to the state's economic development, participate in community life, and provide better opportunities for their children to compete academically and in the workplace. Without free access to information many citizens will be left behind and Arizona will have a population of information "have-nots."

Arizona Library Association (AzLA)

The Arizona Library Association is dedicated to universal citizen access to information. To insure that the people of Arizona have access to information and library services today and tomorrow, all libraries must participate fully in the information superhighway. State, local, and federal governments are cooperating and investing with the private sector to develop information databases and provide connectivity to the information superhighway. Citizens have paid via taxes for the creation of these databases, now there must be free universal access.

Libraries are the first and only place most Arizona citizens have access to electronic forms of information. Affordable or discounted rates for advanced telecommunications services to K-12 schools and public libraries is a crucial element in providing universal services to governmental information.

Universal access to information fosters economic development, the development of an educated workforce, and lifelong learning. In order for Arizona to retain its competitive edge with the other states, Arizona libraries must be able to offer electronic services and information to all citizens. Universal access to information can be provided economically to all citizens only when all libraries throughout the state are connected to the information superhighway.

Arizona State Public Information Network (ASPIN)

The Need for Universal Service for Rural Internet Connectivity

In the 1930s the Rural Electrification Act was passed to meet a huge and pressing challenge: How to plug rural communities into the growing national power grid? Over the next few decades, every rural resident in the United States got that plug, and through it came not just electric lighting but also a revolution in the way they live. We have instituted universal service requirements for a wide-range of services that have revolutionized our society from utilities to dial-tone service. Today we face a similar challenge in making sure that in today's "Information Age" that our communities are plugged into the growing global information grid, the Internet.

The growth of both the number of users and the applications of the Internet has astounded even those of us who have been its most optimistic proponents for many years. Within the last several years, it has grown from a resource used primarily by the research and education sector to a tool used everyday by the business and economic development. As our nation's economy adopts a more global posture and the need for information grows, Internet access becomes more essential for a healthy and equitable society.

The question becomes how do we as a state ensure that our underserved communities will not become the "information have-nots" of the Information Age and are thus isolated from the economic and social opportunities afforded by Internet access.

Rural Arizona does not have access to basic telecommunications services such as frame relay and ISDN. Without these services, large portions of rural Arizona will become insular and information have-nots. Rural Arizona has neither equal nor affordable access.

In order to ameliorate these universal service demands, we see three specific telecommunications needs that must be addressed:

- Equal and affordable access throughout Arizona to basic telecommunications technologies such as frame relay and ISDN.
- Access to new telecommunications technologies such as ATM as they become deployed in the urban areas.
- Empower rural community members through training and education on telecommunication services like the Internet.

Arizona's best way to ensure equal and affordable access in all universal services is to acknowledge new telecommunications as an essential service similar to electricity. We have focused on a few areas to ensure universal service through telecommunications availability, upgradability, and empowerment. Rural Arizona will not be an information have-not if all plugged into the growing global information grid.

Arizona Technology Access Program (AzTAP)

A major area of concern to people with disabilities in Arizona is communications. As may be noted in the national discussion about the impact of Microsoft's Windows 95 release, the disability community is most concerned that new products and means of communications be usable and accessible for all. The graphics and ease of use with a mouse make Windows 95 a great thing for you and me, but they present major obstacles for people with physical disabilities such as low vision or bad arthritis. The release of this software has sparked a major discussion about the needs of individuals with disabilities, especially since many states have an interest in buying this product for their human service providing agencies.

Good client service provided by nonprofit human service organizations, or state agencies is dependent on telecommunications to an extent that was unknown just a few years ago. Statutory requirements for the convening of all sorts of multidisciplinary meetings to determine eligibility, to evaluate a client's physical condition, to see if a piece of assistive works and is appropriate, etc., all require meetings to develop service and procurements plans. This makes it imperative that a person with a disability have the means at-hand to communicate.

Section 508 of the Rehab Act of 1973 mandates that state and federal agencies acquire information technology that is fully-accessible. Arizona is in a unique position to be able to proactively respond to this need by means of a variety of steps that will ensure compliance with this piece of legislation. Other states have certified their compliance with legislative resolutions and/or executive orders. We can do that as well, or take a more holistic approach and tie whatever we do to a more inclusive, state procurement and re-use policy. In this way the process by which the state buys AT equipment and services will fully-reflect compliance with Section 508.

The use of AT devices that are purchased by the state will inevitably result in these devices being discarded by the original users for a variety of reasons. People leave the state, they die, they outgrow the device or service. Doesn't it make sense to ensure that all devices are recycled within a statewide system that ensures their refurbishment and re-issue? In the process of complying with Section 508, we could also incorporate the recycling and adaptive re-use of devices as a statewide directive for all state-funded service providing entities.

Another example of the importance of Universal Service and design, would be found in the emerging augmentative communications industry. The use of augmentative communication devices must be matched and configured to the specific telecommunications means available to both the individual and the state agency that may serve that individual. We suggest that every effort should be put forth to ensure that the telecommunications equipment that is procured by the state and state-sponsored activities, be as accessible as possible, and that existing equipment not be abandoned, but instead, re-used and adapted with an eye toward universal usability.

Lastly, the negative impact of not having accessible telecommunications technology is directly tied to the ability of individuals with disabilities to be employable and therefore productive, as taxpaying citizens. The high level of unemployment among people with disabilities (over 60%) means that a significant minority population is not able to contribute as much economically to society, as the rest of the population. This can and often does engender unfortunate attitudes about the "inability of the disabled" that are so corrosive of individual initiative and effective human service delivery.

This high level of unemployment is not indicative of a lack of desire, but heretofore, it has been a combination of lack of appropriate technology and misunderstandings as to the capability of persons with disabilities. Attempts to address this nationally have been made by Congress with the passage of the ADA, the IDEA Act, the Tech Act, the Rehab Act and the Telecommunications Act. In part, each responded to the need to reduce barriers to access and significant progress has been made thanks to the passage of these laws. The concept of universal service is one that, if implemented on a large scale, holds the promise of further reducing and eliminating barriers that prevent a lot of very talented people from fully participating in American society. We are the poorer for it.

City of Phoenix

Information Superhighway Policy

Phoenix believes that it is essential to promote a wide-range of advanced communications and computer technology to benefit the residents, businesses and institutions within the metropolitan area. Open access to such an "information superhighway" supports critical social, economic, and cultural goals of our community and promotes Phoenix's reputation as a leader in innovative government nationally and internationally.

Phoenix is committed to developing a competitive and technologically current telecommunications environment that will foster and enhance the following:

- **Economic Viability**: The availability of technology is an important factor in the community's ability to remain competitive and attract investment and new business.

- **Efficiency of City Government**: Telecommunications will provide faster and more cost effective delivery of services to the community.

- **Sense of Community**: The creation of an "Electronic Village" will allow citizens to electronically participate in government, business, and community activities.

Although it is the City's desire that the private sector support many of these services, the City believes that it has the responsibility to promote:

- **Universal Access and Equity of Service**: It is essential that affordable access to advanced telecommunication services be available to all citizens as well as businesses, education, and government.

- **Privacy and Security of Information**: The capability must exist to protect the accuracy and security of government information, taxpayers' investment in public records, and the privacy rights of citizens consistent with applicable laws.

- **Protection of Public Rights-Of-Way**: The use of public rights-of-way for telecommunication purposes by private companies should require a reasonable compensation for the use of this public asset.

The Hopi Tribe

Thank you for the opportunity to participate in the **Universal Service** survey; our intent is to describe for you the telecommunications situation that exists here on the Hopi Reservation. While the Hopi situation, which to a large extent stems from geographic remoteness and isolation, may be unusual it is probably not unique in that there are many different kinds of barriers to Universal Service for remote rural Indian reservations in Arizona. This happens to be one of them.

As you may know, Hopi is completely surrounded by the Navajo Reservation. The Navajo Nation operates their own telecommunications utility, Navajo Communications; the Hopi Tribe has no such utility and is not connected to the Navajo utility. Hopi is thus an island without right-of-way to the outside world.

The local telecommunications service supplier on Hopi is Century / Universal Telephone Company of Marion, Louisiana. The long distance supplier for the Hopi Reservation is AT&T. US West owns cellular rights, but there are no receiver/transmitters on the Reservation. Our various telecommunications supplier's corporate remoteness accentuates the difficulties we face in achieving Universal Service.

The telecommunications equipment on the Hopi Reservation is an antiquated analog system which fails frequently. The system lacks data-quality integrity and will not sustain transmission rates higher than 14.4K baud. Century/Universal has been slow to offer to upgrade their equipment, but is considering such a move at present. Their slowness has been characterized as "under regulation" by the Hopi Tribe's MIS director. This assessment is because of the lack of any regulatory requirement for Century/Universal to maintain a reasonable equipment standard on the reservation.

One other "rural penalty" further limits the Hopi participation in the world of modern telecommunication networks. There is no "point-of-presence" (POP) located anywhere on the reservation that is accessible by the general public or the tribal government. Long distance charges would accrue to most of our people because they must use a distant POP provider. The closest POP that I am aware of is in Flagstaff.

Ed Rosenberg, Ph.D. of the

The National Regulatory Research Institute (NRRI)

Universal Service[1]

Universal service programs reduce the effects of geography, disability, and economic status on individuals' use of the telecommunications system.[2] Basic universal service includes affordable access to services required for individuals to be fully functioning, integrated members of society and the economy.[3]

Advances universal service goals include timely deployment of advanced telecommunications infrastructure – including provision for distance learning, telemedicine, ubiquitous connectivity to the information highway, efficient use of communications networks, and consumer choice through the introduction of competition.[4] The sub-goals are intermediate to promoting the welfare of the citizenry and encouraging economic growth and development.

Challenges

Defining Universal Service

Policy makers must define adequate universal service both now and in the future and make it accessible – which implies both availability and reasonable affordability. Moreover, a mechanism for modifying universal service must be in place, since the definition of universal service will evolve over time. However, policy makers might well be wary of adopting a technology-driven or supply-push approach to defining universal service. Instead, a market test may be appropriate in defining universal service. For example, federal legislation being debated in conference contemplates including in universal service any service that has been subscribed to by a majority of residential customers. Universal service also implies a minimum quality-of-service that will be delivered or available ubiquitously.

When deployment decisions are made on a "business case" basis, with potential profitability the sole criterion for making investments, rural and inner-city areas may be bypassed. Policy makers can develop plans that promote timely deployment. Such policies include incentives or inducements to make the necessary investment in designated areas.

Funding and Administering Universal Service Programs

Current policy has overlapping parts, many not targeted. Furthermore, because individual customers may both receive and provide subsidies, it may be difficult to determine the distribution of net benefits among individuals.[5]

Options include direct subsidies, establishing a universal service fund, vouchers, and minimum subscribership goals. The current mix of programs into fewer simpler ones that are be compatible with competition, and all providers and users should be involved. Support should be limited to services, customers, and areas that merit it, and a means for adjusting to changing conditions such as new providers and/or new definitions of universal service should be devised.

Direct Subsidies

Direct subsidies from general taxes are probably the most efficient, but such subsidies are not likely to be politically palatable. Current budget conditions at the state and federal level make even limited incentives such as tax credits for investments in certain areas unlikely. Small-scale demonstration projects such as those funded through the NTIA continue to be useful.

Universal Service Funds

Basic and advanced universal service can be supported through a tax or surcharge applied to all providers and covering all or almost all communications services.[6] The fund can support service to high-cost areas and for low-income consumers and can fund deployment of new technologies in designated areas.

Vouchers[8]

End users could receive vouchers which could be used to purchase service from any willing provider. Vouchers make subsidies explicit, promote consumer choice, and might induce competitive entry into high-cost areas.[9] Vouchers can be targeted at customers, areas, and services that merit support. Only those providers willing and able to provide universal service could redeem vouchers. Providers with carrier-of-last-resort obligations might be allowed a higher voucher rate. If based on the difference between the incumbent's stated cost of service and an average or maximum affordable rate, vouchers could create pressure for greater efficiency.[10]

Minimum Subscribership Plan (MSP)[11]

Local access providers are likely to have better information about the demand for access and the cost of providing access than do regulators. Policy makers could set attainable subscribership goals and allow providers to choose the method of achieving them.[12] If given pricing flexibility and positive incentives, providers are likely to choose least-cost methods. Moreover, the MSP may lead to prices that benefit marginal subscribers, who tend to have low incomes. In addition, MSP regulation can encourage high quality-of-service and is compatible with competition if all providers have goals.

Other Options

Local measured service and limited-use basic service at discounted rates may be useful. Local measured service would reduce the subsidy from light users to heavy users and might allow basic access charges to be reduced. Mandatory local measured service may prove difficult to implement, however, as income high-use customers.

Prohibiting disconnection of basic local service for nonpayment of toll or enhanced service bills might be considered. A corollary would apply partial payments first to basic local access then to other charges. Free or low-cost toll blocking would help keep subscribers on the network, especially those who have trouble controlling toll charges. Another means of supporting universal service and/or carrier-of-last-resort responsibilities to collect termination charges from other local carriers.

State universal service plans could target pockets of low penetration by considering the social and demographic factors that keep some groups from being subscribers. These groups may benefit from targeted plans such as outreach programs aimed at non-English speaking groups, voice mail for the homeless, etc.

Final Thoughts

Competition and universal service may not be in conflict. An examination of the results of local access competition in the United Kingdom and in New Zealand supports this idea.[13] Local access competition may increase penetration by putting downward pressure on access charges or by changing the way companies allocate costs to access. As the network becomes used for a wider variety of services, more of the cost of local loop facilities may be recovered from new services. In addition, the costs of upgrading the network to deliver advanced services should be recovered from those services, not from basic access. Unless people subscribe to the network, they cannot but high-margin enhanced services.

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1. Based on Edwin A Rosenberg, "Public Policy Objectives in Increasingly Competitive Markets: Concepts, Challenges, and Policy Options," presented at the Wisconsin Public Utility Institute's *Workshop on Public Policies Toward Local Telecommunications Services in Increasingly Competitive Markets* Madison Wisconsin, June 28-29, 1995. The views expressed herein are the author's and do not necessarily represent those of the NRRI, NARUC, or any member commissions of NARUC.
2. See John D. Barrown, Phyliss Bernt, and Raymond W. Lawton, *Universal Service in the United States: Dimensions of the Debate*, (Columbus, Ohio: The National Regulatory Research Institute, June 1994).
3. The list of services required may be open-ended. For example, it has been suggested that there should be universal e-mail and Internet access.
4. The idea that competition is a goal of public policy is relatively recent, but, if interest at the state and federal level is any indication, promoting competition in telecommunications may be one of the more highly valued policy goals at present.
5. See, for example, David L. Kaserman and John W. Mayo, "Cross-Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing," *Yale Journal on Regulation* 11, no. 1 (1994): 119-147, and Ross C. Erickson, David L Kaserman, and John W. Mayo, "Targeted and Untargeted Subsidy Schemes: Evidence from Post-Divestiture Efforts to Promote Universal Telephone Service," working paper, (The University of Tennessee: Knoxville, TN. 1995).
6. Vermont has instituted a policy along these lines.
7. Part of the moneys collected through the tax could be designated to provide incentive to deploy advanced infrastructure in rural or inner-city areas that would otherwise be last to receive it.
8. A tax-based universal service fund and a voucher plan are not mutually exclusive, since a tax can be used the raise the revenues to fund the voucher plan.
9. Further discussion of vouchers may be found in John Barrows, "Vouchers and Universal Service," *The NRRI Quarterly Bulletin* 16, no.3 (Fall 1995): 423-30, and Larry Blank, "Telephone Vouchers: Experiences in Other Markets," forthcoming in *The NRRI Quarterly Bulletin* 16, no. 4 (Winter 1995).
10. Vouchers can be designed so that the out-of-pocket cost to of consumers is no more that either a dollar amount based on national or state average rates or a percentage of median household income for the area.
11. See Larry R. Blank, "The Minimum Subscribership Plan (MSP): Policy Reform for Local Telephony," presented at the *Telecommunications Policy Research Conference* Solomons, Maryland, September 30-October 2, 1995.
12. MSP-type plans could also be used to induce deployment of advanced infrastructure.
13. See David Gabel and William Pollard, *Privatization, Deregulation, and Competition: Learning From The Cases of Telecommunications in New Zealand and the United Kingdom*, (Columbus, Ohio: The National Regulatory Research Institute, January 1995).

Residential Utility Consumer Office (RUCO)

The Residential Utility Consumer Office has participated extensively in the Telecommunications Workshops conducted by the Arizona Corporation Commission.

RUCO believes that competition in the telecommunications industry will provide residential consumers with more choices, better service and lower prices. However, the transition to a deregulated market can be dangerous and we at RUCO want to ensure that residential consumers have the protection of regulation until they have the choices of the free market.

We view the Universal Service Fund as a mechanism to ensure that the access that consumers in low-cost areas enjoy doesn't force high-cost consumers (in predominantly rural areas) to face dramatic rate increases. This blending of high-cost and low-cost areas is currently accomplished through state-wide averaging of residential rates paid to incumbent monopoly providers.

The mechanism of state-wide averaging breaks down in a competitive environment because competitors "skim" or "cherry pick" the consumers in the low-cost areas. This leaves the incumbent Local Exchange Carrier to serve the high-cost areas at a loss or forces the Corporation Commission to raise rates in high-cost areas.

RUCO's view (and the current proposal before the Arizona Corporation Commission) is that state-wide averaging can be replaced by a competitively neutral fund to which providers in low-cost areas contribute and from which providers in high-cost areas draw.

Although not a perfect solution, the current proposed Universal Service Fund will allow Arizonans state wide to experience the advantages of competition.

Rural Consumers Coalition for the Advancement of Telecommunications

Statement of Principles Regarding the Future of Rural Telecommunications

As Congress considers the most sweeping revisions of the nation's communications laws in sixty years, it is critical that the needs and interests of all rural and frontier consumers – business, education, farm, health, and residential – be identified and given equal consideration. The following are offered as unifying principles for rural organizations and advocates working together to advance the interests of rural consumers before Congress and the Administration as the telecommunications laws and rules are being re-written. They also serve as guidelines for assessing legislative proposals.

The telecommunications needs of rural consumers must be met and served equally with those of urban areas. It is unacceptable to adopt policies that would assign a lower priority or longer time frame to achieve access to advanced services at affordable rates in rural America.

Technological changes, as well as market and policy changes, make clear that competition in the telecommunications industry is inevitable. National policies encouraging greater competition must include a tangible commitment to policies and incentives that bring competition equally to rural areas in comparison with urban areas, or that provide adequate substitutes where it is not possible.

National policies encouraging competition must include eliminating legal and regulatory barriers to entry into long distance telephone, local telephone and cable television businesses by any entity willing to provide service to rural consumers. Otherwise, unequal competition will likely result in unreasonably high phone rates and reduced capital investments in rural telecommunications infrastructure. Similarly, in a competitive environment all telecommunications providers must be subject to the same regulatory treatment. All telecommunications service providers should contribute equitably to public purpose funds and programs related to that service including requirements for funding universal telephone service. In addition, telephone companies providing video services should, like the cable industry, be subject to the same local government franchise requirements and fees as cable operators.

Lowering long distance rates through such mechanisms as increased competition in long distance services and extended calling areas is particularly important, since rural consumers typically rely more heavily on long distance services.

Universal service programs and policies for local telephone service in high cost areas must be continued in order to ensure affordable rates and infrastructure investment until such time that effective competition can achieve a similar result. In the meantime, mechanisms to fund universal service must ensure that all providers of telecommunications services contribute as a precondition to their market entry.

A uniform definition of basic telephone service for all consumers in rural, frontier and urban areas should be created and allowed to evolve over time to take advantage of new technologies.

Infrastructure sharing between larger and smaller local telephone companies should be encouraged in order to allow rural customers access to advanced telecommunications services at rates comparable to other areas.

(Organizations Signing-On to the Statement of Principles: American College of Nurse Mid-Wives, American Telemedicine Association, National Association of Development Organizations, National Association of Towns and Townships, National Rural Health Association, National Rural Housing Coalition, United Homeowners Association)

Western Governor's Association (WGA)

The West: Forging Opportunity Through Change

Key Elements of Governor Ben Nelson's WGA Theme

SmartStates - Promoting Efficient Market Development of Private & Public Information Technology Networks

The steady march toward global electronic commerce, ushered in by modern information technology, presents a far-reaching opportunity for Western Governors to manage change for the benefit of government, business, and citizens. Information technology is the single most powerful agent of change in organizational life, and there are three key avenues through which the Governors can harness this change to promote market efficiency in the development of accessible, cost-effective networked services for the public and private sectors. First, by identifying opportunities for coordinating western state procurement, by entering into strategic partnerships with industry, and by reviewing state tax and regulatory policies, the Governors can help shape needed investment in network capacity, services, and program-specific applications.

Second, the Governors can identify opportunities for state agencies and education systems to share the development costs of new network applications and perhaps in the actual delivery of services, and, where applicable, ensure that they build on existing industry infrastructure and standards. Third, the Governors can ensure that state agencies and education systems, acting as network "anchor tenants", promote open systems and standards and protocols that avoid obsolescence and ensure network interconnectivity.

The *SmartStates* initiative will bring the Governors together with industry leaders to reach agreement on how cooperation and collaboration in each of these areas can best be achieved; for example, through a Task Force linking western state information technology directors with their industry counterparts to bring specific recommendations to the Governors.

The Western Governors, individually and through WGA, have already begun to use information technology to improve public services in their states. In partnership with the private sector, they are pursuing the development and deployment of advanced education systems, electronic benefits transfer systems, telemedicine networks and electronic health cards, intelligent transportation systems, and others. The Governors' leadership in applying these cutting edge technologies to public services promises both dramatic advancements in specific areas as well as a more strategic payoff in more efficiently performing markets. As a result, the SmartStates initiative should bring the benefits of electronic commerce to more areas of the region more quickly and at a lower cost.

UNIVERSAL SERVICE TO UNIVERSAL ACCESS

Appendix E - State-by-State Summaries

Appendix E - State-by-State Summaries

State Profile Data Sources

STATE DEMOGRAPHICS:

1. **Population:** 1993 Residential Population, U.S. Bureau of Census, Current Population Report.
2. **Size:** 1990 Total Square Mile Area, U.S. Bureau of Census, Census of Population and Housing.
3. **Proportion rural:** 1990 Urban and Rural Population, U.S. Bureau of Census, Census of Population and Housing.
4. **Population per sq. mile:** 1993 Population per Square Mile of Land Area, U.S. Bureau of Census, Census of Population and Housing.
5. **Median household income:** 1992 Money Income of Households -- Median Income, U.S. Bureau of Census, Current Population Report.
6. **Percent below poverty:** 1992 Persons Below Poverty Level, U.S. Bureau of Census, Current Population Report.
7. **Percent on public assistance:** 1992 Public Assistance Recipients (AFDC and SSI), complied by U.S. Bureau of Census.

TELEPHONE SERVICE DEMOGRAPHICS:

1. **Number of lines:** 1993 Total Presubscribed Lines, FCC Statistics of Communication Common Carriers (Table 2.3).
2. **Number of LECs:** 1994/5 Number of LECs Operating in State, Under Agency Jurisdiction of Not, NARUC Compilation of Utility Regulatory Policy 1994-1995.
3. **BOC:** State contact
4. **Market share of BOC:** 1993 Bell Company Percent of Total Lines in State, FCC Statistics of Communication Common Carriers (Table 2.3).
5. **Penetration rate:** 1994 (March) Percent of Households with Telephone Service, FCC Statistics of Communication Common Carriers (Table 1.5).
6. **Local exchange competition allowed:** 1994 NARUC Report on the Status of Competition in Intrastate Telecommunications.

OPASTCO STUDY:(Keeping Rural America Connected: Costs and Rates in a Competitive Era, 1994. Study of OPASTCO 424 small rural LECs.)

1. **Subscribers per sq. mile:** 1992 Subscribers Per Square Mile Served for Rural Telephone Companies (Fig 2.1 - Col. E).
2. **Difference in non-BOC loop costs:** 1993 Percentage Difference Between the UFS Cost per Loop for BOCs and Non-BOC LECs (Fig. 2.6).
3. **Monthly revenues per customer:** 1992 Local Service Revenues per Subscriber per Month (Fig 4.4 - Col. A).
4. **Revenues if supports eliminated:** 1992 Revised Monthly Local Service Revenues if supports mechanisms were eliminated (i.e., DEM weighting, 25% gross allocator to subscriber line usage, USF, and Lifeline/Link-up America programs) (Fig. 4.4 - Col. C).
5. **Percent who would disconnect:** Percent who said they would disconnect service if local service rates went to revised levels (Fig. 5.2 - Col. C). Based on survey of 1,872 residential subscribers.

TELEPHONE SERVICE TECHNOLOGY:

1. **Copper, Fiber, Hybrid Fiber, Microwave, Other Technology:** State contact
2. **Percent local loop digital:** 1993 Percent of Total Equipped Local Loop Circuits (KM) that are Digital, but does not include interoffice circuits. Computed from FCC Statistics of Communication Common Carriers (Table 2.2).

State Profile Data Sources (Continued)

ADVANCED TELECOMMUNICATIONS:

1. **Cable households:** 1994 Cable Households as a Percent of Television Households, A.C. Nielson Company, Media Research Services Group, US Television Household Estimates.
2. **Cable in schools:** 1993 Cable in the Classrooms as a percent of Total Schools, Cable in the Classroom Members, Quality Education Data, Nielson Media Research.

TELEPHONE SERVICE RATES:

1. **BOC residential rate(s):** State contact and state documents.
2. **LEC residential rates:** State contact and state documents.

UNIVERSAL TELEPHONE SERVICE PROGRAMS:

1. **Status of State Universal Service Program:** State contact
2. **Targeted groups:** State contact and state documents.
3. **Definition of basic service:** State contact and state documents.

STATE UNIVERSAL SERVICE FUND:

1. **Fund Administrator:** State contact and state documents.
2. **Contributors:** State contact and state documents.
3. **Basis for contribution:** State contact and state documents.
4. **Types of subsidies:** State contact and state documents.
5. **Who draws from fund:** State contact and state documents.
6. **Is subsidy portable:** State contact and state documents.

FEDERAL UNIVERSAL SERVICE FUNDS:

1. **Lifeline:** State contact and state documents.
2. **Link-up America:** State contact and state documents.
3. **High Cost Fund:** State contact and state documents.

PENDING ACTIONS: State contact and state documents.

COMMENTS: State contact and state documents.

ADVANCED TELECOMMUNICATION SERVICES:

1. **Programs to Access Video/cable Services:** State contact, state documents, and NASTD.
2. **Programs to Access to Advanced Information Services:** State contact, state documents, and NASTD.
3. **Programs for Electronic Access to Government Documents/Records:** State contact, state documents, and NASTD.
4. **Private/public Partnerships:** State contact, state documents, and NASTD.

1995 NTIA/TIIAP GRANTS: Telecommunications & Information Infrastructure Assistance Program (TIIAP), National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce (DOC).

ALABAMA

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STATE DEMOGRAPHICS

Population: 4,187,000
Size: 52,237
Proportion rural: 39.6%
Population per sq. mile: 82.5
Median household income: $25,891
Percent below poverty: 17.1%
Percent on public assistance: 7.1%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,025,288
Number of LECs: 34
BOC: BELL SOUTH
Market share of BOC: 80.5%
Penetration Rate: 90.7%
LEC competition permitted: 8/95

OPASTCO STUDY

Subscribers per sq. mile: 13.6
Difference in non-BOC loop costs: 46.7%
Monthly revenues per customer: $18.94
Revenues if supports eliminated: $30.42
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 18.59%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 65.0%
Cable in schools: 68.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $15.00-$16.00
LEC residential rates: to

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The APSC currently has a docket and workshop on US. The purpose of the workshop is to determine if there is a need for a USF, who it should address, who would be eligible, and who should contribute. A recent docket put Bell under price cap so rates will be lowered. There are no pending rate cases. South Central Bell rates will be flat or go down in the future. LEC rates will generally go up to the level of Bell. A recent PSC order required non-Bell LECs to upgrade technology, if they go under price cap.

COMMENTS: Alabama is in the beginning stages of determining the need for a US support mechanism. They currently don't have a definition of basic service or US, but this will be addressed in the workshop.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Cable companies are participating in the US workshop. A number schools use cable to provide distance learning. The PSC does not regulate cable.

Programs to access advanced information services: This is not part of the US workshop. Local access to Internet is not an issue in Alabama. It is being taken care of in urban areas, but this may come up in workshop.

Programs for electronic access to public/government records: Some state agencies are on Internet, but not the commission. Commission doesn't currently have access to Internet. The Department of Industrial Relations Job Kiosk Project has two touch screen kiosks to be placed in high traffic areas such as shopping malls.

Public/private partnerships: Some LECs have a classroom tariff to provide distance learning capabilities. They may expand this to include hospitals.

1995 NTIA/TIIAP GRANTS

University of South Alabama Center for Health Information, Community Health Information Network (CHIN) will give doctors and support staff in area hospitals and health centers access to patient records and medical information. This will increase the quality of care available to this remote and poor population. (Total $595K, Federal $225K)

ALASKA

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Alaska Public Utility Commission
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STATE DEMOGRAPHICS

Population: 599,000
Size: 615,230
Proportion rural: 32.5%
Population per sq. mile: 1.1
Median household income: $41,969
Percent below poverty: 10.0%
Percent on public assistance: 6.7%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 316,873
Number of LECs: 23
BOC: na
Market share of BOC: 0.0%
Penetration Rate: 91.6%
LEC competition permitted: policy barrier

OPASTCO STUDY

Subscribers per sq. mile: 0.3
Difference in non-BOC loop costs:
Monthly revenues per customer: $20.94
Revenues if supports eliminated: $34.73
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital:
Other Technology: Satellite, BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 50.0%
Cable in schools: 35.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): na
LEC residential rates: $5.00 to $30.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) in initial stage of rule making process
Targeted Groups: None
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The APUC has a rule making docket to adopt US. They are recommending that basic service should include 911, 411, 611, single party, touch tone, white page listing, data transmission over voice grade analog lines and access to optional digital services. The statute allows creation of USF for long distance. Some rural areas have very low penetration rate and are likely targets for US. The APUC is recommending that LECs can only draw from USF, if they participate in the federal programs. At this time they are not sure if there will be a fund or if there is a need for one. If they do set up a USF, all providers will contribute to the fund. Alaska 2000 includes development of a statewide telecommunications plan. The PUC had no rate cases before it.

COMMENTS: Alaska is very dependent on Federal support and they have low subscribership rates in some rural areas. They are looking at issue of US and how to increase subscribership. Alaska has such high cost, they are hoping technology will help them solve the problem.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Rural Alaska TV network (RATNET) provided TV to 248 rural villages via satellite, but state support has been cut and the program ended. It has been succeeded by Alaska Rural Communications Service (ARCS) a rural radio network owned and operated by Native Americans with some state support.

Programs to access advanced information services: One of the principals in the APUC's recommendations says rural areas should have access to advanced information services. They have Internet access providers but not in rural areas. University in Alaska provide access to Internet in rural areas. The PUC has an open docket to upgrade to RUS rules to provide certain data services.

Programs for electronic access to public/government records: The Statewide Library Electronic Doorway(SLED) provides free local access to 93% of population and includes government and business information. The Commission has a Web page and bulletin board. The state created a WWW home page and all state agencies are required to create home pages. They are also exploring the possibility of expanding the WWW service to allow for transaction based processing through Internet services (e.g., renew and pay for driver's licensing, motor vehicle registration, and ferry reservations).

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Bethel Broadcasting, Inc. Distance Delivery Consortium will use grant funds to connect the people of the Delta with each other, Alaska and the rest of the world. The project will provide remote Alaskan villages with low-cost, local modem access to a commercially owned and operated network. (Total $734K, Federal $441K).

State of Alaska Division of Libraries, Archives, and Museums, Southeast Alaska Network (SEAkNet) will provide residents of rural Southeast Alaska access to the information highway via the Statewide Library Electronic Doorway (SLED) for residents of seven isolated communities in Southeast Alaska. They will be able to access in Internet, connect to their state library and government offices, and access information on health, education, community services, and commerce. (Total $598K, Federal $223K)

ARIZONA

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STATE DEMOGRAPHICS

Population: 3,936,000
Size: 114,006
Proportion rural: 12.5%
Population per sq. mile: 34.6
Median household income: $29,593
Percent below poverty: 15.1%
Percent on public assistance: 6.4%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,066,054
Number of LECs: 14
BOC: US West
Market share of BOC: 94.0%
Penetration Rate: 94.1%
LEC competition permitted: 7/95

OPASTCO STUDY

Subscribers per sq. mile: 2.6
Difference in non-BOC loop costs: 82.2%
Monthly revenues per customer: $21.05
Revenues if supports eliminated: $30.69
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 98.47%
Other Technology: BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 56.0%
Cable in schools: 53.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $13.18
LEC residential rates: $4.50 to $21.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND:

Fund Administrator: BOC (US West)
Contributors: LECs, BOC, IXCs
Basis for contribution: Surcharge per access line for LECs and per minute of use on intrastate toll carriers
Types of subsidies: Rate subsidy
Who draws from fund: LECs with high cost (only one currently)
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The ACC is developing a more structured, rule based US program. ACC staff have developed proposed rules which will be before the Commission during the 1st quarter of 1996. This proposed rules define basic service as access to a one-party voice grade line for residential service with touch tone capabilities, access to interexchange carriers, 911, 411, operator services, a white-page directory listing, and telephone relay services for the hearing impaired. Contributors to the fund will include LECs, the BOC, IXCs, and wireless providers including cellular, paging and Commercial Mobil Radio services. The current fund doesn't require everyone to contribute. Contributions for providers of local exchange service will be based on the number of access lines, while IXCs' contributions will be based on percent of total revenues. Any LEC may seek support from the fund with a rate request. A rate subsidy will be provided based on the LECs costs exceeding an ACC established benchmark cost. US West is the proposed interim administrator of the fund, but that responsibility will shift to an independent third party by July 1996.

COMMENTS: Currently Arizona's US support mechanism is being used by one company. They have a rulemaking proposal that will refine the state's USF, establishing a more structured, rule based US program for Arizona. The state also maintains a telephone assistance program which provides discounted services to the medically needy. The Arizona DES administers the program in cooperation with the ACC and the BOC.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Corporate affiliates of local cable entities are seeking authorization to operate as toll carriers in the state and are being reviewed by the ACC for same. Northern Arizona University's NAUNet is a statewide interactive distance learning network encompassing over 20 independent sites. It is complemented by their NAU Learning Alliance network of more than 100 satellite downlink sites. A metropolitan broadband network, ECNet, has been in trials for several years over existing cable infrastructure as a coalition of Arizona State University, DEC, and Cox Communications aiding Computer Integrated Manufacturing applications.

Programs to access advanced information services: The Governor established the Telecommunications Policy Office to spearhead the effort to promote the development of advanced telecommunication services in Arizona. The Office is responsible for establishing and coordinating statewide telecommunications policy. The Arizona State Public Information Network (ASPIN) is based at Arizona State University (ASU) and has through their statewide backbone connected the three universities, urban and rural community colleges and many other public organizations and communities to the Internet. The Arizona Department of Education (ADE) provides AzEdLink, a program for dial-in Internet access for K-12 schools. AzTeC is the state's Free-Net, currently providing Internet access to over 12,000 and placing public access terminals in the Phoenix area. Arizona Health and Information Network (AZ-HIN) is a non-profit consortium using the Internet to connect hospitals, libraries, teaching and health care institutions.

Programs for electronic access to public/government records: The Corporation commission has a STARPAS program that provides paid access to Commission documents (corporation names, filings, etc.) by local dial-in. They have completed the pilot implementation of a WWW page and will be soon providing public access on the Internet. The Legislature is introducing the Arizona Legislative Information System (ALIS) this session to provide a wide range of Internet accessible legislative information.

Public/private partnerships: The Arizona Telecommunications and Information Council (ATIC) is an economic development foundation providing a forum and facilitation for telecommunications development and advanced applications deployment. Datalink has been a pilot program to discover, catalog and route trade related information that may be further developed.

1995 NTIA/TIIAP GRANTS

City of Phoenix, Information Technology Department, will broaden access to its existing network, PhoenixNet, to three underserved target groups, including elderly, disabled, and economically disadvantaged, in 24 public access computer sites established throughout the city. They will also further develop the range of information and services available by dial-in and Internet access with their "Phoenix at your fingertips" program (Total $572K,Federal $225K).

Navajo Community College Development Office. This project, in coordination with ASPIN, will expand several existing pilot projects by developing a telecommunications infrastructure consisting of a digital microwave system to link seven NCC campuses and T1 data links to connect the college system to the Internet to form a single virtual campus for the Navajo Nation (Total $469K, Federal $225K).

ARKANSAS

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STATE DEMOGRAPHICS

Population: 2,424,000
Size: 53,182
Proportion rural: 46.5%
Population per sq. mile: 46.6
Median household income: $28,893
Percent below poverty: 17.4%
Percent on public assistance: 6.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,172,258
Number of LECs: 27
BOC: Southwest Bell
Market share of BOC: 68.2%
Penetration Rate: 90.0%
LEC competition permitted: prohibited

OPASTCO STUDY

Subscribers per sq. mile: 9.6
Difference in non-BOC loop costs: 54.6%
Monthly revenues per customer: $16.71
Revenues if supports eliminated: $28.66
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.41%
Other Technology: ISDN

ADVANCED TELECOMMUNICATIONS

Cable households: 60.0%
Cable in schools: 64.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.00
LEC residential rates: $5.00 to $32.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: no

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: BOC (Southwestern Bell)
Contributors: LECs, BOC, wireless, IXC
Basis for contribution: % of retail billed minutes of use
Types of subsidies: Rate subsidy
Who draws from fund: LECs with intrastate NTS costs per loop greater than 115% of statewide weighted average
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Statute gives commission authority to develop USF. Commission hasn't held any hearings since 1986. Fund is to be phased out by 2000 for three companies. Currently there is a Commission order to look at need to continue or change USF. Commission has taken other steps to increase subscribership by participating in Federal programs. GTE rate case - last rate case reduced GTE from $11 to $6. Rates are expected to move upward initially, then back down as competitors start to enter the market.

COMMENTS: Arkansas is keenly aware of importance of universal service, and US will get more attention due to competition. The big question is how do you know if you need fund? They don't want to loose US due to local competition. They want to make sure people continue to have access to telephone services.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The APSC has no authority over cable service and no cable operators have applied for certification to provide voice and data services.

Programs to access advanced information services: Act 737 creates the Telecommunications and Information Technology Fund and establishes the Joint Committee on Advanced Communications and Information Technology to review legislation pertaining to telecommunications and public information access as well as setting up the Governor's Telecommunications and Information Advisory Board. Act 10069 appropriates $2 million from the Telecommunications and Information Technology Fund for grants to public and non-profit entities for the development of a statewide distance learning and telecommunications network.

Programs for electronic access to public/government records: Joint standing committee under Act 737 will look at universal access to government information. Act 1139 creates the Information Network of Arkansas (INA) as a centralized electronic information system by which public information in Arkansas will be provided via dial-in modem and through links to public libraries.

Public/private partnerships: In last SW Bell rate case, over earnings will be used to upgrade infrastructure in hospitals & schools in state.

1995 NTIA/TIIAP GRANTS

Arkansas Delta Housing Development Corporation, Small-Town Anti-Information Redlining (STAIR) project is an 18-month planning project designed to involve local citizens, small-town municipal governments, universities and community organizations in the evolution of the local information infrastructure. (Total $209K, Federal $96K)

CALIFORNIA

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STATE DEMOGRAPHICS

Population: 31,211,000
Size: 158,869
Proportion rural: 74.0%
Population per sq. mile: 200.1
Median household income: $35,173
Percent below poverty: 15.8%
Percent on public assistance: 10.7%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 18,015,735
Number of LECs: 23
BOC: Pacific Bell
Market share of BOC: 77.7%
Penetration Rate: 95.2%
LEC competition permitted: 7/95

OPASTCO STUDY

Subscribers per sq. mile: 5.8
Difference in non-BOC loop costs: 74.8%
Monthly revenues per customer: $20.64
Revenues if supports eliminated: $48.77
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 9.6%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 64.0%
Cable in schools: 58.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $11.25
LEC residential rates: $11.25to $17.80

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost, Low income/economically disadvantaged
Definition of basic service: Touch tone, voice grade, 911, directory assistance, operator assistance, white pages, long distance, repair service, and privacy protection

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Independent third party
Contributors: LECs, BOC, IXCs, wireless
Basis for contribution: % of billable revenues
Types of subsidies: Rate subsidy for high cost; Company paid difference between rate and subsidy
Who draws from fund: LECs with high cost or eligible subscribers
Is subsidy portable: Yes, for low income

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** No **High Cost:** Yes

PENDING ACTIONS: California has a major rule making investigation looking at a complete revision of US in response to local competition. State has a US rate statewide that subsidizes individuals. The high cost program will change but not individual subsidy. They plan on being done by the end 1997. They don't want the US program to be less than what exists today, and some are advocating a broader definition. The future US program will target groups that are below statewide penetration rate. They don't currently participate in Lifeline and Link-up America, because they will not validate income. The issue of income validation may be reconsidered. Also, they may eliminate subsidy to non-low income in rural areas. There have been some general rate cases for smaller LECs. There are no new entrants yet, but some are applying - up to 40 new carriers, and 20 resellers. In long run residential rates may go up since the current rate may be too low. Deaveraging of rates may cause some rural rates to go up while urban rates may stay flat. They are investigating wireless technology to serve underserved areas.

COMMENTS: California has the oldest and largest program in the country. It was the model for the Federal programs. Changes in local competition are requiring them to look at a major revision of the program.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The PUC doesn't regulate cable.

Programs to access advanced information services: This may be part of revised program. PUC is seeking Federal authority to use US funds to support advanced information applications. Local call access to Internet is an issue in the state. Legislation passed to encourage availability of telecommuting as a work option and 2 year pilot program completed. Recently passed digital signature law to encourage electronic commerce.

Programs for electronic access to public/government records: There is a statewide program to make government documents accessible on the Internet. Commission has web page. The Legislature has a widely-acclaimed program for Internet access of Bills, available for tracking and in full text along with Committee activity. All state agencies are mandated to develop timetables and plans to provide basic electronic access to public databases. UC Berkeley's Digital Library Project is developing technologies for intelligent access to massive, distributed collections of multi-media documents.

Public/private partnerships: Smart Valley is an extensive, successful and widely-modeled after public-private consortium. They facilitate development of flagship applications in advanced information and telecommunications areas, advance a regional approach to NII deployment in "Silicon Valley" to create an electronic community, foster economic development and drive public awareness and education. Their Joint Venture: Silicon Valley Network hosts a interactive public presence on the Mercury Center online service. The California Voter Foundation (CVF) provides the California Online Voter Guide on the Internet and AOL describing candidates and issues. CommerceNet is one of the first and perhaps most successful large-scale market trials of electronic commerce on the Internet. In 1993, Pacific Bell created the California Research and Education Network (CalREN), a $25M program to stimulate the development of new applications for high-speed data communications services in telemedicine, online schools, electronic democracy, and new business partnerships and ventures.

1995 NTIA/TIIAP GRANTS

Western Consortium for Public Health Dept. of Technical and Information Services, with a variety of public and private partners, will demonstrate and evaluate the benefits of video conferencing and remote-data entry/information gathering via wireless telecommunications in a rural public health environment (Total $1,581K, Federal $668K).
HandsNet, Inc., currently brings together more than 4500 public interest and human service organizations across the U.S., providing them with useful on-line information and relevant electronic discussions (Total$400K, Federal$200K).
LA County Office of Education Educational Telecommunications Network (ETN) will carry out a comprehensive telecommunications planning process yielding a replicable planning model for schools to use in customizing their infrastructure design (Total$415K, Federal $165K).
Plugged In-Learning Through Technology will introduce electronic networks to address the specific needs of a variety of underserved members of the local communities in less affluent E Palo Alto (Total $440K, Federal $193K).
Information & Referral Federation of L.A. County, INFO-LINE will provide widespread, low-cost, high-speed access to a comprehensive, centralized and standardized database to improve delivery and access to public welfare system (Total $172K, Federal $86K).
Feather Falls Union School District , in an isolated, rural community, will get Internet connectivity to classrooms (Total $30K, Federal $13K).
LA County Unified School District will establish an Internet link with local, state and national museums and the city library, providing a free, interactive exchange of information among students, teachers and parents in central community facilities (Total $417K, Federal $186K).
Sacramento County Office of Education will demonstrate a model program for delivering literacy services to adults through a cost-effective regional network in 15 predominantly rural counties.(Total $2,284K, Federal $764K).
Metropolitan Area Advisory Committee on Anti-Poverty of San Diego County will bring local information and Internet resources to their inner-city community including community organizations (Total $226K, Federal $113K).
Hermandad Mexicana Nacional Legal Center will develop a Mobile Job Bank to circulate in underserved Hispanic communities using employment databases to provide job placement and counseling (Total $782K, Federal $390).
Santa Ana Unified School District will use an existing cable television network to bring the resources of the Internet to over 50,000 low-income, limited English-speaking K-12 students (Total $1,330K, Federal $664K).
Guadalupe Union School District will bring basic Internet connectivity to their isolated, rura school district and community through a communications and information network (Total $56K, Federal $28K).

COLORADO

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STATE DEMOGRAPHICS

Population: 3,566,000
Size: 104,100
Proportion rural: 17.6%
Population per sq. mile: 34.4
Median household income: $32,716
Percent below poverty: 10.6%
Percent on public assistance: 5.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,071,184
Number of LECs: 36
BOC: US WEST
Market share of BOC: 8.1%
Penetration Rate: 95.7%
LEC competition permitted: 5/95

OPASTCO STUDY

Subscribers per sq. mile: 1.4
Difference in non-BOC loop costs: 91.2%
Monthly revenues per customer: $21.31
Revenues if supports eliminated: $36.10
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** Yes
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 94.04%
Other Technology: ISDN on 70% of lines

ADVANCED TELECOMMUNICATIONS

Cable households: 59.0%
Cable in schools: 75.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $17.82
LEC residential rates: $4.15 to $30.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: Single party, touch tone, voice grade, fax grade, 911, directory assistance, operator assistance, white pages, long distance, modem capable (2400), repair service, privacy protection

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Commission
Contributors: LECs, BOC, IXC
Basis for contribution: 50% based on minutes of traffic for IXCs & 50% based on access charge per line per month
Types of subsidies: Rate subsidy
Who draws from fund: LECs with less than 50,000 access lines with costs above the avg. investment for the traffic
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The CPUC has had a high cost fund in place, and currently they are developing revised rules for the new act. The old version only included small LECs, while the new version includes US West. Under the new bill, US West will be able to draw on the fund and may be receive as much as $20 million. Current data indicates that rates may be too low, so they may be increased. They will have wireless included as contributor in next round of legislation. They are considering a possible telecommunications trust fund to support development of advanced service. Some LECs may drop out or enter depending on investment cycle. No rate cases are currently filled, and there is a freeze on residential rates. Rates can only increase with additional features. They are half way through the five year program to convert all of their analog microwave to digital. Eventually all of the radio will be digital and it will carry many different types of functions. They continue to deploy digital capacity higher and farther out.

COMMENTS: Basic service is defined as a minimum standard that all have to meet, but this may not encompass economic development for advanced features.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Cable providers are not applying now, but they can after new rules are approved.

Programs to access advanced information services: The state is encouraging private competition to bring advanced services to state. If this doesn't work, they may develop other support mechanisms. US West fines for quality of service issues have been applied to fund telecom projects.

Programs for electronic access to public/government records: This is an agency by agency activity. There are government kiosks around the state and many agencies are developing sites on the WWW. The PUC's WWW site features timely news releases including Telecommunication Fund activity. Access Colorado Library and Information Network (ACLIN, created by the Legislature in 1990) is a cooperative project between the Colorado State Library and the Colorado library community. ACLIN seeks to provide electronic access to the information resources of the state's libraries to support the education, business, health, social services, and personal growth activities of the residents of the state.

Public/private partnerships: There is currently a reparation docket underway for US West. They may also set up a telecommunications trust fund to develop infrastructure for distance learning.

1995 NTIA/TIIAP GRANTS

State of Colorado - Colorado Advanced Technology Institute is a partnership of federal, state, local and private entities. They have come together to develop a replicable model of how Geographic Information Systems (GIS) can be put to work in addressing a priority problem facing much of rural America. The goal is to balance economic development and population growth while preserving the rural quality of life and environment (Total $750K, Federal $375K)

Southern Ute Indian Tribe. This project will provide Internet access to the Southern Ute Indian Tribe to enable them to access important information about education, government, culture, health, and economic development (Total $552K, Federal 214K).

CONNECTICUT

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STATE DEMOGRAPHICS

Population: 3,277,000
Size: 5,544
Proportion rural: 20.9%
Population per sq. mile: 676.4
Median household income: $41,059
Percent below poverty: 9.4%
Percent on public assistance: 6.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,856,122
Number of LECs: 3
BOC: NYNEX
Market share of BOC: 0.0%
Penetration Rate: 96.4%
LEC competition permitted: 7/94

OPASTCO STUDY

Subscribers per sq. mile: NA
Difference in non-BOC loop costs:
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** Yes
Fiber : Yes **Microwave:** No
Percent local loop digital: 90.87%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 83.0%
Cable in schools: 85.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.50
LEC residential rates: $8.00 to $15.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Low income/economically disadvantaged
Definition of basic service: Single party, touch tone, voice grade, 911, directory assistance, operator assistance, white pages, long distance access, privacy protection, ANI capability, switching access, receive incoming calls, usage element

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: LECs (changing to independent 3rd party)
Contributors: LECs, BOC, IXCs
Basis for contribution: Total gross revenues as a percent of total state revenues
Types of subsidies: Rate subsidy to carrier but is credited on customer's bill
Who draws from fund: Credits go to eligible low income customers, $3.50 for intrastate and $3.50 for interstate service
Is subsidy portable: Yes

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: Currently the Commission has a proposal from the dominate LEC to establish a high cost USF to off set recent price squeezes. The proposal is under review. Nothing else is pending regarding US, since they just issued new US rules in February 1995. Teleco is in for a rate review, but Commission is committed to no rate increases. With competition, rates should go down. Carriers will be deploying Hybrid Fiber Cable throughout state for next 10 years.

COMMENTS: AT&T plans to start offering local phone service early next year and has targeted Connecticut as its first state to enter this market.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Some cable companies are looking to provide local telephone service.

Programs to access advanced information services: Videoconferencing proposals are under evaluation to furnish both educational and administrative agencies with equipment and support services. Connecticut's Joint Committee on Educational Technology (JCET) assists the State Board of Education and the Board of Governors for Higher Education in coordinating more effective and efficient use of educational technology. This committee has oversight responsibility for the distribution of a $10.4M Bond Authorization for Technology Infrastructure for Connecticut Public Schools.

Programs for electronic access to public/government records: There is a law on the books requiring electronic access to all offices, and Connecticut agencies' web sites on the Internet are proliferating. The state library is acting as the coordinator for this effort.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Bridgeport Futures Initiative, Inc. Bridgeport Futures Initiative, and over 20 community partners, will bring the first electronic network (BridgeNet) to the depressed inner-city of Bridgeport, a designated Enterprise Community (EC) Ten community access points will open in eight low-income neighborhoods, social service workers with laptop computers will visit homes to demonstrate how information technology can be used as a problem solving tool, and trainers will serve as recruiters and mentors. (Total $695K, Federal $225K).

National Cristina Foundation. The project will bring together a wide range of non-profits from fifteen states to organize a national system to recycle donated computers. An estimated 80 million personal computers will be "obsolete" by 1998, but by transfer to the public and non-profit sector, may yet be of good use. (Total $1,960K, Federal $561K).

DELAWARE

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STATE DEMOGRAPHICS

Population: 700,000
Size: 2,397
Proportion rural: 27.0%
Population per sq. mile: 358.2
Median household income: $35,739
Percent below poverty: 7.6%
Percent on public assistance: 5.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 427,437
Number of LECs: 1
BOC: Bell Atlantic
Market share of BOC: 100.0%
Penetration Rate: 95.8%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile:
Difference in non-BOC loop costs:
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 100%
Other Technology: ISDN

ADVANCED TELECOMMUNICATIONS

Cable households: 77.0%
Cable in schools: 69.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $9.40
LEC residential rates: $9.40 (one LEC)

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: Rural/high cost, Low income/economically disadvantaged
Definition of basic service: Rotary, 911, directory assistance, white pages, basic dial tone, switching access, relay access

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** No **High Cost:** No

PENDING ACTIONS: The DPSC has pending rules that should be implemented by mid-summer 1996. The rules have been pending since 1993. The rules will apply to new service providers. The PSC's objective is to make sure no group is worse off than they are now. They don't have a USF because the statute says rates should be non-discriminatory. They would have to change the law to set up a USF. The state is very conservative. Eventually, they won't be able to avoid setting up a fund, if they have to establish a carrier of last resort. The carrier of last resort could collect from a USF if it could demonstrate the need and others would have to pay into the fund. They have price cap regulations and three pending filing applications. Some in state think ISDN should be part of universal service.

COMMENTS:

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: They are upgrading their network now, and improving infrastructure into all schools and libraries. The Office of Telecommunications Management is deploying routers in all elementary schools throughout the state to support placing computers in every classroom. They also expect to have ISDN in all schools by Spring 1996. Some in the state talk about information as a public good.

Programs for electronic access to public/government records: Not currently

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

University of Delaware - Center for Applied Science & Engineering program will increase access to all types of educational opportunities for students with disabilities by using the Delaware Assistive Technology Information Network. DATIN will increase the skill level and connectivity of school district personnel, students with disabilities, and their families (Total $447K, Federal $223K).

DISTRICT OF COLUMBIA

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STATE DEMOGRAPHICS

Population: 578,000
Size: 68
Proportion rural: 0.0%
Population per sq. mile: 9,482.8
Median household income: $30,357
Percent below poverty: 20.3%
Percent on public assistance: 13.3%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 779,786
Number of LECs: 1
BOC: Bell Atlantic DC
Market share of BOC: 100.0%
Penetration Rate: 88.9%
LEC competition permitted: statutory barrier

OPASTCO STUDY

Subscribers per sq. mile:
Difference in non-BOC loop costs:
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 100%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 47.0%
Cable in schools: 65.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $3.00-$14.60
LEC residential rates: $3.00-$14.60

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: Low income/economically disadvantaged, potential disconnects from long distance
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: DC is unique because they only have one LEC. While the LEC has an economy service rate for low income of $3.00, there has been a significant decline in the penetration rate. To address this issue, the PSC is looking at US as part of a new rate case. They will be developing a definition of basic service as part of the rate case, and identifying what, if any, additional groups should be targeted for US - schools, health care, etc. There is legislation in front of the DC council currently to allow local competition. If this occurs they may need to set up a USF. Bell Atlantic has promised to keep residential rates frozen until 2000 in the new rate case.

COMMENTS: The PSC has taken significant action regarding the penetration rate to make sure US is available and is investigating what else should be done.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: Providing ISDN at a reasonable rate for schools is an issue in Bell's rate case.

Programs for electronic access to public/government records: There is no formal mandate to do this but some agencies are developing ways to provide public access. There is a lot of interest in making government more accessible to the public.

Public/private partnership: Bell's rate case is looking at this. AT&T recently launched a volunteer partnership initiative to improve two of the city's special education schools with new computers for computer laboratories, building repairs and administrative process improvements, donating equipment and services valued at more than $100K.

1995 NTIA/TIIAP GRANTS

Association of Occupational and Environmental Clinics. This project will allow health care providers to tap into the expertise of specialists in the field of occupational and environmental medicine. Health care providers will be able to send questions about patients' illnesses to an Internet mailing list and receive evaluations from the expert participants (Total $44K, Federal $21K).

Soundprint Media Center, Inc. The Global Public Telecommunications Network (GPTN) is a laboratory of community network services that will provide low-cost public access to on-line information resources, including audio archival materials, radio programs, textual materials associated with the archival resources, and, ultimately, a similar array of video resources (Total $1,700K, Federal $850K).

United Cerebral Palsy Association Community Services Division. This project is designed to connect individuals with disabilities and their families to the National Information Infrastructure. Disabled individuals will also be given the on-line addresses of groups that share the same challenges and situations. (Total $597K, Federal $225K)

FLORIDA

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STATE DEMOGRAPHICS

Population: 13,679,000
Size: 59,988
Proportion rural: 52.0%
Population per sq. mile: 253.3
Median household income: $27,456
Percent below poverty: 15.3%
Percent on public assistance: 6.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 8,025,917
Number of LECs: 13
BOC: Bell South
Market share of BOC: 61.4%
Penetration Rate: 92.6%
LEC competition permitted: 7/95

OPASTCO STUDY

Subscribers per sq. mile: 13
Difference in non-BOC loop costs: -6.9%
Monthly revenues per customer: $16.77
Revenues if supports eliminated: $30.32
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 35.43%
Other Technology: 95% digital switches

ADVANCED TELECOMMUNICATIONS

Cable households: 71.0%
Cable in schools: 65.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $10.65
LEC residential rates: $6.00 to $11.63

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) in initial stage of rule making process
Targeted Groups: None
Definition of basic service: Touch tone, voice grade, 911, directory assistance, operator assistance, long distance, flat rate residential

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The FPSC just completed evidentiary policy making proceedings on an interim US mechanism. Revised Chapter 364, Florida Statutes, mandates an interim US mechanism be in place by 1/1/96. The Commission is to deliver a report to the Legislature and Governor on the need for and possible structure of a permanent mechanism by 1/1/97. The Legislature then has until 1/1/2000 to mandate a permanent mechanism. They are considering what US means (US is not equal to basic service, but US may be more than basic service). They are not sure if a USF will be the mechanism used to protect certain groups. What US is trying to protect is being considered in the current docket. They are not likely to have a broad subsidy. The availability of service is not a problem in Florida, but price is more an issue. The new statue allows LECs to enter the market. Residential rates may be capped for 3-5 years. Some local LECs are trying to do rate rebalancing

COMMENTS: The FPSC receives relatively few complaints involving local exchange companies and almost no complaints on phone service, so quality of service is not an issue. If people want telephone service, they'll get it. They already has low local rates so rates are not a big issue in Florida.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: They don't regulate cable, but they have some cable companies applying for telecommunication service. Cable will be involved in phone service in future. Cable companies may do pretty well in the future since they have a high penetration rate.

Programs to access advanced information services: They expect that competition will take care of expanding access to advanced services. The Department of Management Services offers state and local government and certain other qualifying organizations low cost access to the Internet. Florida has a very active community network alliance and seven regional Free-Nets are currently in operation.

Programs for electronic access to public/government records: State Bills are currently available and one can find out just about anything on the State's web page. The Florida Communities Network helps state and local governments in sharing information and acts to foster economic development by enhancing the telecommunications infrastructure and access to public information, and to improve government efficiency with a more efficient flow of information between agencies. The Information Resource Management Advisory Council (IRMAC) has a Public Access User Advisory Group working on policy development.

Public/private partnerships: Public/private partnerships are illegal in Florida.

1995 NTIA/TIIAP GRANTS

Southeast Florida Library Information Network, SEFLIN will cultivate a network of users-as-guides, helping disadvantaged citizens of the three-county area make full use of this resource. More that 120 corporations, all of the public and several private high schools, libraries, and all local colleges and universities will be able to access this time-sensitive information immediately (Total $509K, Federal $225K)

GEORGIA

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STATE DEMOGRAPHICS

Population: 6,917,000
Size: 58,977
Proportion rural: 36.8%
Population per sq. mile: 119.4
Median household income: $28,889
Percent below poverty: 17.8%
Percent on public assistance: 8.5%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 3,661,660
Number of LECs: 36
BOC: Bell South
Market share of BOC: 83.8%
Penetration Rate: 93.2%
LEC competition permitted: 7/95

OPASTCO STUDY

Subscribers per sq. mile: 13.9
Difference in non-BOC loop costs: 30.5%
Monthly revenues per customer: $18.12
Revenues if supports eliminated: $32.09
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 27.79%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 63.0%
Cable in schools: 66.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.33
LEC residential rates: $4.00 to $18.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: None
Definition of basic service: single party, touch tone, 911, modem grade (9600), 1+ dialing

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The GPSC is in process of developing rules for a USF. All telecommunication providers will contribute to fund and this may include wireless and cable if provide basic service (voice not video/TV). They will specify a percent of revenues in rules and who will administrator fund. A rate subsidy of so much per line will go to providers of US. One cable company has applied for certification, and they will provide phone service over cable network. They currently have one pending rate case.

COMMENTS: Georgia is in the process of developing a new system to accommodate competition so citizens do have universal service. They currently have 92% coverage. Basic service includes single line business.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: One cable company is applying to be a carrier. US West is becoming the first BOC to compete in another BOC's territory, having recently received authority from the Georgia PSC to provide local telephone service over its MediaOne cable systems.

Programs to access advanced information services: This is not now a part of US. AIS would have to be more widely used before this becomes an issue.

Programs for electronic access to public/government records: Yes, but it is not centralized. GeorgiaNet has a number of state agencies that are accessible. They do have campaign funds reporting on the Internet, and more agencies are bringing up a Web presence.

Public/private partnerships: Georgia Distance Learning & Telemedicine Act of 1992 (SB 144) authorizes and directs DOAS to develop a statewide distance learning & telemedicine network. It creates a procedure for funding of new distance learning and telemedicine systems and provides an initial fund source and creates a governing board. The resultant Georgia Statewide Academic and Medical System (GSAMS) currently has 227 installed distance learning sites and 60 telemedicine sites making it the largest videoconferencing system in the world.

The Georgia Center for Advanced Telecommunications Technology (GCATT) is a division of the Georgia Research Alliance (GRA). Their recently completed 150,000 square foot facility was funded by $24M in state allocations and $5M in private matching funds. It will provide a meeting ground where academia, business leaders, government representatives, and researchers can collaborate on emerging technologies and will house technology demonstrations during the 1996 Centennial Olympic Games showcasing Georgia's achievements in advanced telecommunications.

Bell South must make infrastructure investments of $500 million per year for five years for infrastructure improvement which include distance learning and telemedicine.

1995 NTIA/TIIAP GRANTS

Southeastern Library Network will address the general problem of integrating such distributed data by demonstrating that existing standards for electronic records, network protocols and software tools can be used to develop a model regional information system. It will produce a decentralized on-line system for the Southeast region of the nation (Total $852K, Federal $419K).

HAWAII

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STATE DEMOGRAPHICS

Population: 1,172,000
Size: 6,459
Proportion rural: 11.0%
Population per sq. mile: 182.4
Median household income: $42,171
Percent below poverty: 11.0%
Percent on public assistance: 5.9%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 595,817
Number of LECs: 1
BOC: na
Market share of BOC: 0.0%
Penetration Rate: 94.5%
LEC competition permitted: 6/95

OPASTCO STUDY

Subscribers per sq. mile:
Difference in non-BOC loop costs:
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 72.23%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 84.0%
Cable in schools: 82.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.40
LEC residential rates: $14.40 (one LEC)

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted groups: Rural/high cost, Economically disadvantaged/low income, Users with disability
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND: No (see pending)

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: The HPUC has opened a docket and issued draft rules on competition and US. The definition of basic service in the draft rules includes single party, touch tone, voice grade, 911, directory assistance, operator, white pages, and relay service. The draft rules include a USF, and both high cost and low income groups are targeted. For low income groups the subsidy would be 50% of the basic rate. The law allows for direct distribution of the subsidy to customers based on need. All telecommunication providers would contribute to the USF including LECs, BOC, wireless and cable. "Telecommunication provider" is broadly defined in law. Non-telecommunication providers may have to contribute to the fund if they directly benefit from the telecommunication infrastructure and directly compete with telecommunication providers. In high cost program, the subsidy would go to carrier if the difference in cost is greater than 120% of basic rate. The program would be administered by the Commission.

COMMENTS:

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Telecommunication service excludes cable TV, but telecommunication carrier could include cable provider if they provide local service. One cable company, Oceanic, has applied for local service.

Programs to access advanced information services: As part of draft rules they will review definitions of basic service from time to time. The Commission is actively involved in updating the network. Hawaii has pioneered the provision of government and other information of interest in electronically accessible and online forms with their Hawaii FYI established in 1991. Due to a current fiscal crisis, Hawaii Inc. was not funded as of June 30, 1995, but the State Dept. of Budget and Finance continues to operate the popular service, Hawaii FYI, with its links to Hawaii related businesses, education, government, non-profit organizations, and visitor industry information systems. The High Technology Development Corporation (HTDC) is and agency of the state's Dept. of Business, Economic Development and Tourism (DBEDT), who not only facilitates the development and growth of commercial high technology industry in Hawaii, but assists various state and local agencies in getting up on the Internet.

Programs for electronic access to public/government records: This is not under the HPUC's jurisdiction. Contact Office of Information Practices (808) 586-1400.

Public/private partnerships: See Hawaii Inc. above.

1995 NTIA/TIIAP GRANTS

State of Hawaii - Dept. of the Attorney General. The Juvenile Justice Information System (JJIS), using leased telephone lines and computer equipment, enables law enforcement officials throughout the islands to share important information about juvenile offenders (Total $714K, Federal $222K)

State of Hawaii - Dept. of Business, Economic Development. HI-TIME will provide the state government with public principles, strategic objectives, and a plan of recommended actions to guide decision making on telecommunications and information technology infrastructure (Total $361K, Federal $177K).

IDAHO

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STATE DEMOGRAPHICS

Population: 1,099,000
Size: 83,574
Proportion rural: 12.6%
Population per sq. mile: 13.3
Median household income: $27,784
Percent below poverty: 15.0%
Percent on public assistance: 3.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 535,604
Number of LECs: 16 (regulated)
BOC: US West
Market share of BOC: 75.5%
Penetration Rate: 94.8%
LEC competition permitted: prohibited (residential)

OPASTCO STUDY

Subscribers per sq. mile: 0.7
Difference in non-BOC loop costs: 87.1%
Monthly revenues per customer: $14.51
Revenues if supports eliminated: $37.37
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 98.91%
Other Technology: 95% digital switches

ADVANCED TELECOMMUNICATIONS

Cable households: 54.0%
Cable in schools: 63.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $11.61
LEC residential rates: $9.40 to $17.20

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost (not states but implicit)
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Independent 3rd party
Contributors: LECs, BOC, IXCs
Basis for contribution: Surcharge on all local access lines, and each intrastate toll minute
Types of subsidies: Bulk check to carrier
Who draws from fund: LECs are eligible if 1) LEC rate for 1-party single line is in excess of 125% of weighted statewide average and 2) average charge per minute for MTS/WTS access service is in excess of 100% of statewide average. 7 LECs currently draw from fund.
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The IPUC has no pending actions regarding US, but a task force is looking at Idaho's telecommunications law. They hope to get a change in lifeline fund requirements and come up with a different eligibility mechanism. Currently there is no need to define basic service, but it may be an issue in the future. US may be reconsidered if local competition occurs. Currently there is a monopoly. US West rates are under review. US West rates may go up $1 per year with improvements in service quality. US West prefers residential rates go up and business rates go down. Under the current alternative regulation plan settlement proposal, residential rates will go up but business rates won't go down.

COMMENTS: Idaho has a good mechanism now and the USF insures an affordable rate for most, but not all. They still have some pockets with very low penetration. Also, local call doesn't give enough service, extended area service is the challenge.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable providers are included under the current law, but they are on task force looking at change in law.

Programs to access advanced information services: There is so much private activity that they aren't sure they need to get involved. The Commission has insured all customers are served by one-party, touch tone, electronic switches (nearly all digital) and nearly all interoffice routes are digital.

Programs for electronic access to public/government records: Some departments have WWW page, but not all. The Information Technology Division of the Department of Administration manages and coordinates all Internet access for Idaho state government through a contractual agreement with NorthWestNet, for Domain. The Division also maintains the state's WWW presence. The PUC has a homepage with downloadable versions of their Rules available as well as biographies of the Commissioners and various meeting agendas and minutes. A task force (InfoTech 96) is looking at linking state offices on the Internet.

Public/private partnerships: It is difficult to achieve such partnerships under current law.

1995 NTIA/TIIAP GRANTS

Lewis-Clark State College - Institute for Community Development, is developing a regional network of community-based networks that will make access to advanced information services affordable. Twelve Idaho communities and over 25 partners are participating in this project to identify specific information needs in the areas of adult education, K-12 education, and medical and other services. (Total $486K, Federal $225K)

Southern Idaho Medical Information Network, a Community Health Information Network (CHIN) called SIMIN will provide integrated clinical information systems to the health care providers in the area, enabling them to share patient information and "best practice" approaches to patient care. (Total $6,796K, Federal $1,699K)

ILLINOIS

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STATE DEMOGRAPHICS

Population: 11,697,000
Size: 57,918
Proportion rural: 15.4%
Population per sq. mile: 210.4
Median household income: $31,707
Percent below poverty: 15.3%
Percent on public assistance: 7.9%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 6,743,917
Number of LECs: 56
BOC: Ameritech
Market share of BOC: 82.8%
Penetration Rate: 93.5%
LEC competition permitted: 1988

OPASTCO STUDY

Subscribers per sq. mile: 9.9
Difference in non-BOC loop costs: 62.1%
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 95.26%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 57.0%
Cable in schools: 64.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $11.20
LEC residential rates: $5.40 to $28.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place (IL has two funds)
Targeted Groups: Low income/economically disadvantaged customers (EDF); Rural/high cost areas (HCF)
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: (EDF) Non-profit organization; (HCF) LEC Association
Contributors: (EDF) Customers voluntary contributions; (HCF) IXC, primary toll carriers
Basis for contribution: (EDF) Voluntary; (HCF) Intrastate minutes of use
Types of subsidies: (EDF) Waiver of $10 installation charge; (HCF) Subsidy to carrier based on cost above a sliding scale percentage above statewide average costs
Who draws from fund: (EDF) Goes to carrier based on the number of eligible public assistance customers requesting: (HCF) Small LEC, based on average cost per access line versus the statewide average
Is subsidy portable: (ED) yes; (HCF) no

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Staff is filing proposals for US and proposed rules. They are to be done by April 1996. Basic service will be defined as part of staff proposal. They are not sure if the USF will be directed at high cost and/or low income. To date they have been more focused on high cost, but have targeted low income. Subscribership rates are declining in some areas of the state. They have adopted price cap regulations so residential rates will be frozen for 5 years. Rates for smaller LECs may go up with deaveraging.

COMMENTS: Illinois is committed to keeping rates at an acceptable level in the future. The legislature is reluctant to subsidize low income, even though subscription rates are declining in some low income areas. As they continue to deaverage cost, new companies will have to pay to compensate those who built the infrastructure. LECs don't participate in the Federal Lifeline program because the Commission can't require the LECs to match funds.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The statewide telecommunications "Illinois Video Network"(IVN) presently provides interactive 384kbs video transmission to 36 sites throughout the state, and it should more than double in size in the next two years. MCI is involved in a two year trial using cable to deliver telephone service.

Programs to access advanced information services: As part of staff proposal they might look at advanced information services and requiring existing lines be modem capable lines (14.4 baud). The Illinois State Board of Education (ISBE) is currently expanding their 800 number toll-free program for K-12 school Internet connectivity and planning to eventually supply each school with a high speed connection.

Programs for electronic access to public/government records: There is some access, but not on a statewide basis. They will be expanding this is future.

Public/private partnerships: The National Center for Supercomputing Applications (NCSA) at the University of Illinois at Champaign-Urbana developed Mosaic, a software application, which in its ability to graphically navigate the WWW, has nourished the international explosion in Internet use. Illinois stresses high technology companies in its economic development activities and over 1,000 information technology companies are now located within a 150 mile radius of Chicago, the "Silicon Prairie."

1995 NTIA/TIIAP GRANTS

West Central Illinois Educational Telecommunications Corp. CONVOCOM is upgrading and extending an existing microwave infrastructure from analog to digital, the project will provide industries, non-profit organizations, government offices, and private individuals in Quincy, IL, the opportunity to partake in educational training and face-to-face meetings at a multitude of teleconferencing destination sites throughout Illinois and the rest of the country (Total $486K, Federal $225K).

Governors State University - Center for Extended Learning & Communications. The Learning in Community On-line Network (LINCOLN) will serve underserved rural counties and suburban areas south of Chicago. The project will use the Internet, local information access, audio conferencing, and video conferencing to support citizens' efforts to improve their communities (Total $801K, Federal $388K).

INDIANA

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STATE DEMOGRAPHICS

Population: 5,713,000
Size: 36,420
Proportion rural: 35.1%
Population per sq. mile: 159.3
Median household income: $28,663
Percent below poverty: 11.7%
Percent on public assistance: 5.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,910,142
Number of LECs: 43
BOC: Ameritech
Market share of BOC: 61.7%
Penetration Rate: 92.9%
LEC competition permitted: no regulatory bar

OPASTCO STUDY

Subscribers per sq. mile: 12.9
Difference in non-BOC loop costs: 30.0%
Monthly revenues per customer: $16.19
Revenues if supports eliminated: $24.75
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.46%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 59.0%
Cable in schools: 63.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $13.50
LEC residential rates: $3.00 to $25.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: BOC
Contributors: LECs, BOC, wireless, IXCs
Basis for contribution: Intrastate carrier common line access minutes - originating & terminating
Types of subsidies: Rate subsidy, Direct infrastructure reimbursement, Opportunity Indiana waives hook-up
Who draws from fund: LECs eligible if intrastate NTS costs are above the statewide average; 14 LECs draw from fund.
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: They are in the middle of a local exchange workshop looking at local competition --due to finish by 1/15/96. Currently, they have a high cost fund, but some want revised US program to target low income. Target groups and definition of basic service will be discussed in workshop. Contributors to fund will include all telecommunication companies. Ameritech administers current USF but this role will have to go to 3rd party in revised program. There are no pending rate cases. Last year they did a review of rates, and Ameritech phased down end user charges and touch tone charges. They may need to do some rate rebalancing with smaller LECs.

COMMENTS: From the staffs' analysis, the penetration rate (94%) looks good and they know areas where they need to improve. It is hard to predict where they'll be since they're in a state of change.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: They don't regulate cable and cable companies don't have the infrastructure to provide telephone service at this time. So far, no cable companies have applied for certification. Indiana is in the process of building a business case for statewide video conferencing. They plan to implement 5 to 8 video conference sites around the state.

Programs to access advanced information services: They are not sure if these will be included as part of US. Indiana Higher Education Telecommunication System (IHETS) is a state-funded consortium of all 39 public and private universities and colleges (77 campus sites) for the sharing of voice, video and data networks. IHETS manges INDnet (Indiana's Internet backbone), Indiana Partnership for Statewide Education (collaborative development and delivery of distance learning) and ACCESS Indiana (state-led partnership to expand telecommunications infrastructure and assure information access for all citizens). Indiana has a Rural Datafication Project championing Internet connectivity for rural communities.

Programs for electronic access to public/government records: Through the "Access Indiana" program Ameritech will provide access to government documents. Indiana is setting up Internet access for government agencies and community networks. The Legislature has a unique program providing portable computers and a wireless LAN for members of the Indiana General Assembly to help cut the cost of operations and improve Legislative and constituent services.

Public/private partnerships: Ameritech and the IURC came to an agreement with Ameritech's referred to as "Opportunity Indiana." The agreement calls for over $130 mil. in infrastructure deployment, a major grant program for distance learning and a moratorium on local measured service. Through "Opportunity Indiana" Ameritech will spend $5M/year to help school, library and government agencies. They will identify needs, upgrade infrastructure, and provide grant money. Also see ACCESS Indiana above. Indiana is considering outsourcing for a majority of its state government data processing needs.

1995 NTIA/TIIAP GRANTS

None.

IOWA

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STATE DEMOGRAPHICS

Population: 2,814,000
Size: 56,276
Proportion rural: 39.4%
Population per sq. mile: 50.4
Median household income: $28,880
Percent below poverty: 11.3%
Percent on public assistance: 5.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,415,328
Number of LECs: 160
BOC: US West
Market share of BOC: 65.4%
Penetration Rate: 96.3%
LEC competition permitted: 5/95 (never prohibited)

OPASTCO STUDY

Subscribers per sq. mile: 8.5
Difference in non-BOC loop costs: 85.1%
Monthly revenues per customer: $13.92
Revenues if supports eliminated: $24.40
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 92.3%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 59.0%
Cable in schools: 73.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $11.05-13.05
LEC residential rates: $2.00 to $24.78

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: House File 518 has directed the Utilities Board to look at universal service but it did not mandate US. They have had a workshop and currently have a rule making docket. They are looking at US as part of local competition. If they establish a fund, they would develop definitions for basic service and consider target groups, but they're not sure they need a USF. A USF would probably be targeted to both high cost and low income groups. US West recently filed a rate rebalancing case. US West wants to increase residential rates by $2 and lower access charges and toll rates. Iowa just enacted legislation that allowed companies to go under price cap.

COMMENTS: Iowa is looking at necessity of a USF as competition develops. They are not sure of need one now, but increased competition may create the need.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable providers have applied for certification.

Programs to access advanced information services: The Iowa Communication Network (ICN) provides a two-way interactive broadband network for long distance learning and access to the Internet to all schools and each county seat. Iowa has used $114.5M in bond initiatives (plus a $4M U.S. DOE grant and other allocations now totaling $180M) to install 2800 miles of fiber optic backbone throughout all 99 counties to 126 end points. Currently, all citizens are within 12 miles of a video classroom and next year they plan on connecting 317 high schools followed by some 500 municipal libraries, various teaching hospitals and public television stations. The state expects to save $11M per year in transmission costs when it moves its government data traffic to the fiber network.

Programs for electronic access to public/government records: A state network hooks county and state agencies but is not accessible to the public. There is a limited state government WWW presence hosted by the Iowa Public Telecomputing Network (IPTN), a regional Free-Net.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Harlan Municipal Utilities. Through this project citizens of rural Shelby County, Iowa, will have access to an advanced communications network. Fifteen sites throughout the county will be linked to provide a variety of services. City, county, school, and library information will be available to people at computers in the public library (Total $460K, Federal $200K).

Youth & Shelter Services, Inc. The Rural Home Youth Communications Project will use electronic telecommunications technology -- videophones, computers and Internet access -- to connect therapists to their clients, no matter how far apart they are physically during their sessions. Five service centers will have video-phone systems connected to the main center where the therapists will be located (Total $379K, Federal $189K).

Luther College will construct a fully interactive video classroom, enabling its nursing students and patients living in rural and economically depressed Decorah County to gain access to the training and expertise available at the Mayo Clinic (Total $225K, Federal $121K).

KANSAS

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STATE DEMOGRAPHICS

Population: 2,531,000
Size: 82,282
Proportion rural: 30.9%
Population per sq. mile: 30.9
Median household income: $30,447
Percent below poverty: 11.0%
Percent on public assistance: 4.6%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,350,551
Number of LECs: 45
BOC: Southwestern Bell
Market share of BOC: 83.3%
Penetration Rate: 94.2%
LEC competition permitted: no statutory barrier

OPASTCO STUDY

Subscribers per sq. mile: 4.6
Difference in non-BOC loop costs: 68.7%
Monthly revenues per customer: $13.55*
Revenues if supports eliminated: $28.07*
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 100.0%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 67.0%
Cable in schools: 68.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $11.00
LEC residential rates: $3.50 to $13.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US); an active docket is under consideration by the commission
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The KCC has a universal service docket. They've talked about life-line and a one time forgiveness program, but nothing is set. The decision should be in place by March 1997. They expect they will have a USF. They will define basic service which is likely to include single party, touch tone, digital, access to 911, installation, 24 hour repair, dial tone, and directory listing . They are likely to target low income with the lifeline program. High cost/rural areas will be handled differently. They're trying to come up with a way to subsidize high cost areas. They will also have to be some rate balancing. They're pushing for a single package covering rates and US.

COMMENTS: They want telephone service to be just as affordable and accessible as it is today, nothing less than they have now. * OPASTCO rates are based on 6 LECs in study.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Cable is unregulated in the state. Cable companies might become competitor with LECs in the future. Satellite TV and dish seems the most likely solution for rural areas rather than cable. Video teleconferencing continues to be a major state project including teleconferencing for distance learning, telemedicine, and administrative teleconferences.

Programs to access advanced information services: A consumer advocacy group has asked the Commission to look at universal access to Internet. They are early in the investigation of the Internet and there is a cooperative venture between Kinnet and Computerland to provide Internet access.

Programs for electronic access to public/government records: They have internal sharing now between agencies, but are going to provide access to the public. The State of Kansas created Information Network of Kansas (INK) in 1990, funded by user fees, to provide electronic access to state, county , local and other governmental information for Kansas citizens. Some 400 information resources are available (including data from 55 state agencies), accessible through an 800 number or over the Internet for a $50 annual subscription fee and $.40 per minute. Annual revenues range from $4 to $5M, with most of the money going back to state agencies.

Public/private partnerships: Through "Tele-Kansas" SW Bell has upgraded party lines within its services territory. SW Bell is also providing "interactive video" for all schools in its territory. United Telephone developed a plan for modernization and upgrading to one party services to all offices with its services territory and is working ahead of schedule on the associated upgrades.

1995 NTIA/TIIAP GRANTS

Hays Medical Center Office of Rural Health. This project will link medical centers and hospitals with 100 home health patients. The program will interactively monitor a patient's general health, medication, diabetic condition, blood pressure, diet, hygiene and mental health status (Total $608K Federal $301K).

Western Kansas Community Services Consortium. This project will create 36 public access and community college sites throughout western Kansas. In addition to the huge variety of data available on the Internet, these sites will allow local educational networking for students, faculty, and staff at the seven colleges (Total $535K Federal $225K).

KENTUCKY

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STATE DEMOGRAPHICS

Population: 3,789,000
Size: 40,411
Proportion rural: 48.2%
Population per sq. mile: 95.4
Median household income: $23,567
Percent below poverty: 19.7%
Percent on public assistance: 9.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,736,972
Number of LECs: 20
BOC: Bell South
Market share of BOC: 58.3%
Penetration Rate: 89.9%
LEC competition permitted: policy barrier

OPASTCO STUDY

Subscribers per sq. mile: 15.7
Difference in non-BOC loop costs: 11.8%
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 17.7%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 64.0%
Cable in schools: 72.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $18.00
LEC residential rates: $5.00 to $18.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: The KPSC has a docket on local competition that includes US and a USF. They expect to be done in 1997. Part of the docket will defining basic service. The docket will determine whether support goes to the carrier or directly to the customer. Target groups most likely will be low income. They may make US a separate part of the docket. There are no rate cases pending. Bell South is under a rate cap plan, so rates will be frozen for 3 years.

COMMENTS: Kentucky's penetration rate is not as good as some states. In part this is due to the rural nature of the state. They will be exploring US in the current docket. The Commission ruled against Lifeline program because getting on the network was the problem not staying on it.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable carriers have applied for certification at this point. The Kentucky TeleLinking Network (KTLN) provides state government with 22 interactive videoconferencing sites that will expand to 48 sites.

Programs to access advanced information services: The Kentucky Education Technology System (KETS) was mandated by the legislature to provide a data/video communications network, including Internet access to all school districts (176) and schools (1366). A consortium of firms was selected to provide Kentucky with an "Information Highway," the contract calling for fixed cost access to the "highway" with a network terminal at every public switched wire center.

Programs for electronic access to public/government records: The Department of Information Systems was established to assist agencies that want Internet nodes for agency specific information dissemination.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Appalachian College Association. This grant will create a plan to bring information infrastructure to its 33 member colleges and universities, and create a comprehensive strategy for distance learning including the development of Rural Information Services Centers (RISC) (Total $101K, Federal $50K).

Forward in the Fifth. The Eastern Kentucky Access to Telecommunications (EKAT) project seeks to rebuild a traditionally underserved region through education, training, and provision of access to a computer network linking individuals, communities, and schools. EKAT will establish eight satellite downlink sites and offer inexpensive local connections to the Internet (Total $346K, Federal $225).

Federation of Appalachian Housing Enterprises. The FAHE will connect 21 rural community-based housing providers to HandsNet (the national housing and human services information network) and to the Internet (Total $21K, Federal $10K).

Jefferson County Public Schools Educational Technology Department. Project RUN (Rural Urban Network) will create a fiber optic, metropolitan wide area network that will provide all partners with access to information networks. This project will provide the first network access for the inner city residents of Louisville and the rural residents of Pike County (Total $1,972K, Federal $800K).

Center for Kentucky Rural Economic Development will develop an information network to support entrepreneurs, small and new businesses, and the expansion of the region's existing industries. The Center will house videoconferencing and distance learning facilities, connected to the Kentucky Information Highway through a high-speed telephone line (Total $960K, Federal $396K).

LOUISIANA

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STATE DEMOGRAPHICS

Population: 4,295,000
Size: 49,650
Proportion rural: 31.9%
Population per sq. mile: 98.6
Median household income: $25,479
Percent below poverty: 24.2%
Percent on public assistance: 10.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,051,434
Number of LECs: 21
BOC: Bell South
Market share of BOC: 92.8%
Penetration Rate: 91.5%
LEC competition permitted: prohibited

OPASTCO STUDY

Subscribers per sq. mile: 10.7
Difference in non-BOC loop costs: 80.7%
Monthly revenues per customer: $21.95
Revenues if supports eliminated: $44.24
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 10.58%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 68.0%
Cable in schools: 60.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $10.97- $15.05
LEC residential rates: $9.00 to $18.50

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: None
Definition of basic service: Single party, touch tone, 911, directory/operator assistance, white page, long distance service, affordable line connection, telephone relay, and customer support

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** No **High Cost:** Yes

PENDING ACTIONS: The PSC has proposed regulations for competition with a mandate for US. They are to be before the Commission by 1/9/96. There are no target groups, because they want to make telephone service affordable to all -- not limited to economically disadvantaged. Basic statement about mandate for US is included in regulations but specifics of USF are not detailed. All TSP (telecommunication service providers) must contribute to USF, but it is not yet been determined how fund will operate except that subsidies will go to carriers. Commission has a rate case with Bell South who has been on incentive regulation since 1990. Bell South has asked to be regulated under price regulation. Initially residential rates are likely to go up, due to be deaveraging - urban rates will go down and rural rates will go up. But, they will establish fund to address this. As competition enters the market rates should come down.

COMMENTS: The PSC is progressing toward implementation of a US program. They have started -- now they need to finish. The biggest hurdle was defining what US means, the biggest challenge is getting competitive rules approved. There is very low participation in the Federal Lifeline program because there are no state matching funds and participation is not mandated.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Two cable providers are just beginning to apply for certification. The state is using videoconferencing activities in distance learning, telemedicine and judicial applications.

Programs to access advanced information services: Louisiana has a Goals 2000 Technology Plan currently funded at $2M to develop a systemic statewide plan to increase the use of state-of-the-art technologies in classrooms and school libraries in order to enhance educational curricula.

Programs for electronic access to public/government records:

Public/private partnerships: Bell South has grants for hospitals and they provide reduced rates for schools, libraries, and medical schools. They also wave link-up costs for high speed lines to these organizations. Senate Bill 774 creates the Coordinating Council on Telemedicine & Distance Education in the Office of the Governor to promote and ensure communications between public agencies in the areas of telecommunications.

1995 NTIA/TIIAP GRANTS

University of New Orleans - Business/higher Education Council will create a model for developing, funding, managing, and expanding a regional WWW community network site with public and private partners. Education is a key focus for the project, and will include technical training, multimedia training modules, and non-credit certification programs in information technology (Total $781K, Federal $369K).

MAINE

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STATE DEMOGRAPHICS

Population: 1,239,000
Size: 33,741
Proportion rural: 55.4%
Population per sq. mile: 40.2
Median household income: $29,705
Percent below poverty: 13.4%
Percent on public assistance: 7.6%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 685,438
Number of LECs: 24
BOC: NYNEX
Market share of BOC: 83.8%
Penetration Rate: 95.0%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile: 11
Difference in non-BOC loop costs: 14.3%
Monthly revenues per customer: $11.09
Revenues if supports eliminated: $25.63
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 14.2%
Other Technology: BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 65.0%
Cable in schools: 41.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $10.50 - $12.50
LEC residential rates: $4.75 to $14.50

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) in initial stage of rule making process
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributor:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The MPUC is considering policies to establish local competition. Currently, they have a statewide rate that doesn't vary, but with local competition they will have deal with US issues. Defining basic service is beyond scope of the current docket. They are considering an access element that would maintain current geographic cross-subsidies in order to keep rates at current levels. Anyone who competes where costs are higher will get a subsidy, and anybody who competes were costs are lower will contribute. NYNEX just went through a rate case for an alternative form of regulation. This may lead to a decrease in residential toll rates, and a small increase in basic rates.

COMMENTS: Most people in Maine have telephone service -- rates are stable and there are few complaints. But change in competition may cause rates to change. Universal access approach allows for access to advanced information services. They have a special program for hearing impaired who get a 70% reduction in intrastate toll calls.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable companies have applied for certification.

Programs to access advanced information services: There are library and school programs to provide access to Internet. NYNEX rate case included improving infrastructure to provide access in Internet. NYNEX was ordered to reduce rates by $14M per year, with $4M per year earmarked for education. State has objective to provide affordable access to AIS. The Maine Telecommunications and Information Technology Planning Project has issued its final draft report and recommendations. A General Fund Bond Issue for $15M has been authorized to expand telecommunications capabilities and student learning opportunities in Maine schools. The establishment of a Maine statewide Free-Net, MaineCAN, is under discussion.

Programs for electronic access to public/government records: The state has WWW page, and a number of initiatives under way, and a State Information Service Policy Board to address this issue. They also are setting up kiosks throughout state for job bank information and driver licenses. The PUC hosts a homepage with access to state and federal resource materials.

Public/private partnerships: A toll agreement was reached with NYNEX (they expect independent companies to follow shortly) to provide schools and libraries with substantial savings.

1995 NTIA/TIIAP GRANTS

The University of Maine System. This grant is designed to reduce disparities in access to telecommunications in several different rural regions of the state. The end result will be a statewide "network of networks", including school districts, universities and colleges, libraries, hospitals and rural health clinics, municipal governments, courts and legal aid organizations, economic development agencies, and state government departments (Total $1,731K, Federal $850K).

MARYLAND

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STATE DEMOGRAPHICS

Population: 4,965,000
Size: 12,297
Proportion rural: 18.7%
Population per sq. mile: 507.9
Median household income: $37,287
Percent below poverty: 11.6%
Percent on public assistance: 6.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,860,375
Number of LECs: 2
BOC: Bell Atlantic
Market share of BOC: 99.8%
Penetration Rate: 95.5%
LEC competition permitted: 1994

OPASTCO STUDY

Subscribers per sq. mile: 77.1
Difference in non-BOC loop costs:
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 100%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 62.0%
Cable in schools: 65.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $9.52 -11.17
LEC residential rates: to

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributor:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: US may be a commission case in future due to local competition, but not now. Bell will be filing to go under price cap, and more companies will be entering into residential service.

COMMENTS: US hasn't been a problem before, but it may be now with deregulation.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Commission doesn't regulate cable, but some cable companies may apply for certification. Maryland has a Video Distance Learning initiative to connect community/junior colleges, high schools, and cultural institutions for distance learning.

Programs to access advanced information services: This may become an issue but not now.

Programs for electronic access to public/government records: With the Maryland Electronic Capital project, the state is establishing the infrastructure to allow state, county, and municipal governments, as well as the private sector, to share resources and information., with an emphasis on citizen access.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Goodwill Industries International, Inc. will create a support network for other social service organizations to communicate with each other and their clients. It will also provide an opportunity for clients to receive training in the use of information technology (Total $599K, Federal $245K).

MASSACHUSETTS

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STATE DEMOGRAPHICS

Population: 6,012,000
Size: 9,241
Proportion rural: 15.7%
Population per sq. mile: 767.1
Median household income: $36,558
Percent below poverty: 10.0%
Percent on public assistance: 7.5%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 3,714,730
Number of LECs: 5
BOC: NYNEX
Market share of BOC: 99.9%
Penetration Rate: 96.2%
LEC competition permitted: 1986

OPASTCO STUDY

Subscribers per sq. mile: 91.6
Difference in non-BOC loop costs: 41.2%
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 6.95%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 76.0%
Cable in schools: 80.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $16.85
LEC residential rates: to

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: Unlimited calling within the local exchange calling area and within municipalities

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: US is part of a pending docket on local competition. They have finished evidenture phase, and should have a decision in March 1996. They have not yet adopted a definition for basic services. Low income groups would be most likely target. They did not have a fund before because they had one dominate carrier, NYNEX (99% of market), who made internal adjustments to cover high costs areas and equalize rates. Open docket on local competition will address USF issue, but they are not likely to set up a fund immediately. NYNEX is going to price access so it will still be able to cover its costs. NYNEX basic residential rates are frozen for six years.

COMMENTS: Local competition docket will give them an opportunity to reassess US. It is hard to assess how much a company needs a subsidy. They would rather let carriers recover costs from other customers. If they do have local competition, they will need to find some way to fund US.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Cable companies are active in docket to enter the competitive market.

Programs to access advanced information services: Massachusetts Access to Government Network, MAGNet, is a statewide high speed communications network that will link together government agencies, libraries, schools, and businesses throughout the state. MAGNet will include 20,000 desktop computers for the state's own information workers, 2500 public access points in libraries and schools as well as from kiosks, potentially 300,000 business clients, and an estimated 2,000 municipal employees. Citizens will be able to perform "self service" government inquiries and transactions from home computers, the Internet or public access kiosks and library workstations.

Programs for electronic access to public/government records: Massachusetts Access to Government Information Services (MAGIS) will make information available by the secretary of the commonwealth, including the citizen's guide, facts and figures, and the commonwealth's goods and services bulletin, with details on pending state services and goods acquisitions. They also have set up kiosks helping to make government more accessible. These will allow users a single point of entry into government services and provide one-stop shopping.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Quality Educational Scholastic Trust, Inc. connects 40 public schools and colleges to the Internet, and will provide network access to the 139,000 residents and 20,000 students in geographically isolated Berkshire County (Total $579K, Federal $225K).

Shrewbury's Community Cablevision. This project will make the bookmobile a mobile on-line public access center, giving the computer terminals on the bookmobile instant access via the fiber network to the main library, a statewide library system of over 100 other libraries, and the Internet (Total $34K, Federal $17K).

MICHIGAN

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STATE DEMOGRAPHICS

Population: 9,478,000
Size: 96,705
Proportion rural: 29.5%
Population per sq. mile: 166.8
Median household income: $32,347
Percent below poverty: 13.5%
Percent on public assistance: 9.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 5,239,540
Number of LECs: 38
BOC: Ameritech
Market share of BOC: 84.4%
Penetration Rate: 95.5%
LEC competition permitted: 1991

OPASTCO STUDY

Subscribers per sq. mile: 11.7
Difference in non-BOC loop costs: 40.1%
Monthly revenues per customer: $11.31
Revenues if supports eliminated: $19.87
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.96%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 61.0%
Cable in schools: 76.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $10.38
LEC residential rates: $3.76 to $12.30

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US), but a legislative task force is looking at it.
Targeted Groups: None
Definition of basic service: White page listing and dial tone

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributor:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: There is nothing pending now regarding US. The Commission doesn't regulate anything but basic telephone service. They have an unregulated market but there is little or no local competition. However, seven companies are authorized to provide local service. Currently, they are operating under Michigan Telecommunications Act (SB722) of 1995. The revised act requires LECs to provide low income with a 20% discount if income is 150% of poverty level and 65+ get a 10% discount. It is not likely they will develop a USF since they are a low cost state and given the present political climate. The legislature is not concerned about underserved areas but has convened a task force to look at the issue. Ameritech says cost are $18, so rates are likely to go up in the future, and costs will be moved to the local loop.

COMMENTS: Michigan may have peaked with respect to US. They will try new experiment in competition and see what it happens. It may mean that there won't be any modernizing of infrastructure and penetration rates may fall. Intercity penetration rates are declining now.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: They have a program linking all schools to Internet using Ameritech excess earnings. TCI Continental and other cable companies are installing 2-way broadband systems to link schools to the Internet. In many cases, this service is free or provided at very low rates. This includes some two-way video.

Programs for electronic access to public/government records: There is a move to put all documents on the Internet. The state government has a web page with a number of agencies on it.

Public/private partnerships: There are grants to schools to provide distance learning. They used Ameritech excess earning to connect schools to Internet and all schools are now wired. Michigan Information Network is a collaborative effort to link Michigan residents to the "Information Superhighway." The governor wants to connect business, citizens, and education with a collaborative effort of the state and private sector telecommunications companies.

1995 NTIA/TIIAP GRANTS

Delta-Schoolcraft Intermediate School District - Northwoods Math-Science Center will provide the K-12 schools in the south central Upper Peninsula of MI with full Internet capability, integrating of the project's existing distance learning video and audio network with Internet access (Total $551K, Federal $224K).

Greater Kalamazoo - Telecity USA, is linking local businesses, institutions and citizens to the national and global information infrastructure. It will create a network of networks (CommunityNET, LearnNET, CollegeNET, HealthNET, BizNET, and JobNET) benefiting as many as 200,000 end users (Total $2,016K, Federal $650K).

MINNESOTA

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STATE DEMOGRAPHICS

Population: 4,517,000
Size: 86,943
Proportion rural: 30.1%
Population per sq. mile: 56.7
Median household income: $31,077
Percent below poverty: 12.8%
Percent on public assistance: 5.7%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,459,839
Number of LECs: 103
BOC: US West
Market share of BOC: 75.3%
Penetration Rate: 96.4%
LEC competition permitted: 8/95

OPASTCO STUDY

Subscribers per sq. mile: 6.8
Difference in non-BOC loop costs: 54.4%
Monthly revenues per customer: $15.25
Revenues if supports eliminated: $23.02
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.78%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 51.0%
Cable in schools: 66.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.10
LEC residential rates: $5.00 to $30.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated universal service (US) in initial stages of rule making process
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: In 1995, the legislature required the Commission to develop rules for US. The statutory deadline is August 1997. They will be defining basic service as part of the rule making process. They are not sure about target groups since they are very early in process. They will be developing a USF or some other mechanism. Contributors will be defined as widely as possible to include any telecommunication provider. The LECs are doing well, so rates will get lower. They have already had some rate reductions for LECs. The Commission has ordered all companies to have digital switch and fiber optic lines between all exchanges.

COMMENTS: Telephone service is good today and they want to keep it that way. They want to make sure Minnesota don't loose US due to changes in local competition.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No state agency regulates cable, but both major cable providers have been granted telecommunication licenses. MNet state video network has 52 sites in and working, with another 23 to be installed in the next 6 months. The Legislature appropriated $10.5 million in grant money to expand distance learning using interactive video technology to all school districts currently without it and providing Internet access to all school districts and libraries.

Programs to access advanced information services: Internet is not a telecommunication service, so the PUC is not addressing it in rule making. Access Minnesota seeks to increase the public's awareness of the Internet throughout the state by making it more accessible using existing network infrastructures. Public access terminals will be located in county extension offices in 60 communities throughout the state. They received a $425K grant in 1994 from the NTIA/TIIAP program. The Minnesota Government Information Access Council is developing principles and recommendations for future action.

Programs for electronic access to public/government records: Government Information and Access Council is looking at how this should be done. Contact is Lee Larson (612)296-1334

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Independent School District 318. This project will benefit the Northern Minnesota community of Grand Rapids by connecting five major buildings in this rural school district (over 2,000 square miles) to the Internet (Total $411K, Federal $190K).

MISSISSIPPI

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STATE DEMOGRAPHICS

Population: 2,643,000
Size: 48,286
Proportion rural: 52.9%
Population per sq. mile: 56.3
Median household income: $20,585
Percent below poverty: 24.5%
Percent on public assistance: 11.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,116,718
Number of LECs: 20
BOC: Bell South
Market share of BOC: 93.9%
Penetration Rate: 88.7%
LEC competition permitted: policy barrier

OPASTCO STUDY

Subscribers per sq. mile: 8.2
Difference in non-BOC loop costs: 51.3%
Monthly revenues per customer: $21.40
Revenues if supports eliminated: $39.36
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 16.44%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 58.0%
Cable in schools: 63.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.85 - $19.00
LEC residential rates: $11.50 to $18.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: BOC administers fund, state oversees
Contributors: LECs and BOC
Basis for contribution: Minutes of use
Types of subsidies: Rate subsidy, Direct infrastructure reimbursement
Who draws from fund: 13 LECs, mostly independents and Bell South a small amount
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The Commission has opened a docket for competition that will include US. They should hold hearings in early 1996. They will discuss the definition of basic service in the docket. They may also target the fund at rural communities where there is a lack of competition. The docket will change the current USF. The new pool will have all parties participate in the USF, not just LECs. The docket will also change the formula for determining contributions. In the revised US program, a subsidy may be available for some but not others. The Commission recently ordered a price cap on Bell South residential rates and some charges will be eliminated. The Commission wants small LECs to provide Bell like services before reducing rates. They have refrained from intervening in infrastructure development, and expect new competitors will bring in new infrastructure technology and fiber.

COMMENTS: Basic telephone service is available throughout Mississippi -- services are available at reasonable price. They are looking at US, and how to maintain it in Mississippi.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable providers have applied for certification since it is against state law. The Commission is reconsidering allowing cable in through a dual certification program. The state has installed two video conferencing rooms in the north and central (capitol) sections of the state. They will also connect 20 sites provided by the community colleges and 12 distance learning sites.

Programs to access advanced information services: From the PUC's perspective, advanced services will not be included in US unless there is some directive from Washington. MS Senate Bill 2945 established the Council for Education Technology to oversee and approve the implementation of new and enhanced technology infrastructures for the educational community. The state is providing Internet access in conjunction with the distance learning network, ultimately to some 1200 schools and district offices.

Programs for electronic access to public/government records:

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Mississippi Dept. of Education - Office of Educational Technology. The Mississippi Family Math and Science Network Project is a learning partnership among parents, children, schools, libraries, and communities that will bring five low-income rural MS communities access to computer information networks (Total $1,615K, Federal $800K)

MISSOURI

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STATE DEMOGRAPHICS

Population: 5,234,000
Size: 69,709
Proportion rural: 31.3%
Population per sq. mile: 76.0
Median household income: $27,490
Percent below poverty: 15.6%
Percent on public assistance: 6.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,810,915
Number of LECs: 42
BOC: Southwestern Bell
Market share of BOC: 74.8%
Penetration Rate: 92.1%
LEC competition permitted: prohibited

OPASTCO STUDY

Subscribers per sq. mile: 9.0
Difference in non-BOC loop costs: 125.9%
Monthly revenues per customer: $13.91
Revenues if supports eliminated: $26.02
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 94.93%
Other Technology: fixed cellular

ADVANCED TELECOMMUNICATIONS

Cable households: 53.0%
Cable in schools: 66.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $7.55 - $12.50
LEC residential rates: $4.00 to $16.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: Single line, dual tone, 911, digital interoffice transmission, availability of custom calling features, access to long distance service

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Commission has a docket on intraLATA presubscription and local competition. US may come up in that docket. They are looking at safe guards to protect US, nothing has happened yet. US was not an issue in the past, but now it is given local competition. Definition of basic service may be part of docket, if additional services require additional costs. It is too early to tell what groups might be targeted or if there will be a USF. These issues are part of the docket. Participation in the Lifeline program may also become an issue if rates start to go up. There are pending rate cases involving smaller LECs before the Commission. Generally residential rates are going up, and the impact to subscribers is mixed. Rate increase, however, have included the provision of additional services.

COMMENTS: There currently is not a problem with US in Missouri. Local exchange rates have been low. If rates start to go up, Commission may have to do something to keep them affordable. The average residential rate in Missouri is $9.50.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: One cable provider applied for certification.

Programs to access advanced information services: United is conducting an experiment to allow toll free access to Internet, but may not expand this program, since AT&T is opposed to it. Missouri Distance Education Research Network (MoDERN) drives educational networking and distance learning Applications. The Missouri Research and Education Network (MOREnet), a consortium affiliated with the University of Missouri - Columbia, has become the defacto public state network for Internet services. They provide Internet access to 42 higher education institutions and are working to connect all 530 school districts. Their Project REAL: Remote Electronic Access for Libraries will bring all 136 public libraries online and they support an active group of Community Information Networks around the state.

Programs for electronic access to public/government records: Several state agencies have a home page, but not the PSC at this time. The state's Office of Administration is working in cooperation with MOREnet to develop a Network Information Plan to assist agencies in the selection, collection, and publishing of information via the Internet.

Public/private partnerships: SW Bell as part of settlement agreement will fund special projects including a "Telecommunity Center" for video conferencing, etc. in 5 locations in the state.

1995 NTIA/TIIAP GRANTS

Community Resource Network (CRN). The Neighborhood Network is to disseminate high-value city data that supports neighborhood revitalization efforts, and to support computer access without requiring costly computer purchases by the largely volunteer neighborhood organizations. It will provide such information as property ownership, dangerous building status, water shut-off records, housing court dockets and crime statistics.
(Total $787K, Federal $385K).

Public Television 19, Inc. Every school district in Kansas and Missouri will have access to a video information network to be created by Kansas City Public Television (Total $319K, Federal $159K).

Ozarks Regional Information On-line Network (ORION). The NeighborNet project will bring small communities in rural southwest Missouri community information networks -- places where the general public can access information, including local information, on-line (Total $273K, Federal $129K).

MONTANA

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STATE DEMOGRAPHICS

Population: 839,000
Size: 147,046
Proportion rural: 47.5%
Population per sq. mile: 5.8
Median household income: $26,602
Percent below poverty: 13.7%
Percent on public assistance: 5.4%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 435,594
Number of LECs: 8
BOC: US West
Market share of BOC: 77.6%
Penetration Rate: 95.4%
LEC competition permitted: not prohibited

OPASTCO STUDY

Subscribers per sq. mile: 0.5
Difference in non-BOC loop costs: 66.3%
Monthly revenues per customer: $13.39
Revenues if supports eliminated: $31.70
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 76.27%
Other Technology: Digital radio, BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 57.0%
Cable in schools: 53.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $13.84
LEC residential rates: $7.10 to $16.38

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: There is a task force looking at the issue of US. The Commission is interested in finding out effects of local competition on universal service in the state. They will address this issue as part of local competition. What constitutes basic service under local competition will also be an issue as well as target groups. There is considerable interest in discounted rates for schools and libraries. A USF is not an immediate issue. PTI is in for substantial rate increase. The increase is driven by a change in Federal USF subsidies due to PTI's increased size. The smaller LECs have joined together to upgrade their infrastructure and provide advanced technologies.

COMMENTS: Most of the network is in good shape. Urban areas have access but the real problem of penetration is in rural areas. If one defines US more broadly, then the rural problem is much bigger. The current rates for local service are reasonable but there will be upward pressure. The real problem is customer service with US West.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: The Capitol Complex Fiber Backbone reaches all major buildings in the capitol complex for government network support. The state's Information Services Division is expanding SUMMITNET to include Internet access and serve state agencies, local government agencies, institutions of education, libraries, tribal colleges, and qualifying non-profit organizations. The Kootenet Project involves three rural communities which are upgrading their communities telecommunication infrastructure, and four small phone companies which are providing local call access to the Internet.

Programs for electronic access to public/government records: Department of Administration is working on this. The contact is Tony Herbert (406)444-2700. Currently, access is only for state offices but they may be accessible to the public in the future.

Public/private partnerships: The University of Montana has a program that provides the community access to the Internet. There have also been projects involving an educational bulletin board, local tribal colleges, and distance medicine.

1995 NTIA/TIIAP GRANTS

City of Hardin Economic Development. This project will develop local and wide area networks to provide computer access to the Internet for Big Horn County residents. This will improve and enhance information currently available to teachers, students, library patrons, medical patients, business people, and government officials. Citizens will have access to a "virtual library collection" (Total $25K, Federal $12K).

Montana State University-Northern will use existing telecommunications networks to deliver coursework to 30 extremely rural communities. They will provide K-12 courses, advanced placement high school classes, college and graduate level courses, in-service training to teachers, and consultations with medical personnel (Total $1,578K, Federal $695K).

NEBRASKA

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Nebraska Public Service Commission
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Lincoln, Nebraska 68509
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STATE DEMOGRAPHICS

Population: 1,607,000
Size: 77,359
Proportion rural: 33.9%
Population per sq. mile: 20.9
Median household income: $30,177
Percent below poverty: 10.3%
Percent on public assistance: 4.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 862,718
Number of LECs: 42
BOC: US West
Market share of BOC: 53.9%
Penetration Rate: 96.9%
LEC competition permitted: not prohibited

OPASTCO STUDY

Subscribers per sq. mile: 2.3
Difference in non-BOC loop costs: 28.5%
Monthly revenues per customer: $12.90
Revenues if supports eliminated: $32.83
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 72.15%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 65.0%
Cable in schools: 52.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.90
LEC residential rates: $4.00 to $15.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The Commission has opened a docket to look at the need for a USF. They are in the comment stage and no hearings have been set. The driver behind this issue is local competition. US was not an issue in a regulated market. They have a separate docket on local competition. The docket on USF will address the definition of basic service, target groups, and funding mechanisms. Targeted groups could be both high cost and low income, but more toward high cost. They expect that all carriers will contribute to the USF, and it will probably be a rate subsidy based on cost. They are not sure if it will go to the carrier or customer. Residential rates are likely to go up. They may use cellular or radio in some very rural to provide US.

COMMENTS: The Commission is interested in seeing if there's a need for a USF.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable companies. have applied for certification, but they may get into the PCS market.

Programs to access advanced information services: Nebraska has a program to get Internet services to all schools - but not to all communities. This program is funded by tax dollars. The Nebraska legislature has created a Commission on Informational Technology to develop a statewide telecommunications strategy for state services while providing a synergetic partnership with business and industry. Local access to Internet is an issue that may be addressed in the future.

Programs for electronic access to public/government records: Nebraska on-line was set up through the Library Commission.

Public/private partnerships: Nebraska has programs to build a frame relay throughout state for a interactive video network and some distance learning projects. Through Data Network over 150 K-12 school districts will be connected to the Internet via a frame relay. Sandhills technology/ Telecommunications Educational Project (STEP) is constructing this network within several US West local exchanges to provide distance learning and access to advanced information applications.

1995 NTIA/TIIAP GRANTS

Gage County District 15 Beatrice Public Schools. The Beatrice Connection will allow the entire city and the surrounding area to be linked effectively through electronic communication. It will provide Internet training and a WWW server (Total $581K, Federal $230K).

City of Lincoln - Department of Finance/Data Processing Division. InterLinc is designed to assist the city's urban and Lancaster County's rural communities place computers in low income or rural areas to reduce gaps between information "haves" and "have-nots." Dial-up, toll-free access will be available to citizens with computers and modems and government departments and agencies will build interactive WWW content (Total $548K, Federal $185K).

NEVADA

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Nevada Public Service Commission
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Carson City, Nevada 89710
(702) 687-6034 Fax: (702) 687-6110

STATE DEMOGRAPHICS

Population: 1,389,000
Size: 110,567
Proportion rural: 11.7%
Population per sq. mile: 12.6
Median household income: $32,026
Percent below poverty: 14.4%
Percent on public assistance: 3.6%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 855,382
Number of LECs: 13
BOC: Nevada Bell
Market share of BOC: 28.8%
Penetration Rate: 92.8%
LEC competition permitted: 5/95

OPASTCO STUDY

Subscribers per sq. mile: 0.5
Difference in non-BOC loop costs: -32.2%
Monthly revenues per customer: $15.56
Revenues if supports eliminated: $30.86
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** Yes
Fiber : Yes **Microwave:** No
Percent local loop digital: 10.36%
Other Technology: Fixed cellular and BTRS

ADVANCED TELECOMMUNICATIONS

Cable households: 66.0%
Cable in schools: 71.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $10.00
LEC residential rates: $5.75 to $16.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: Touch tone, voice grade, 911, white pages, long distance access, and dial tone

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Independent third party
Contributors: All telecommunication providers
Basis for contribution: % of intrastate retail revenues
Types of subsidies: Rate subsidy, Direct infrastructure reimbursement
Who draws from fund: Small LECs if rate of return is below commission set level
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The Commission has no pending actions with respect to US since they just adopted new omnibus telecommunication regulations that includes a Universal Service Fund. They are transitioning from a state wide fund to a universal service fund. No money is in state USF, but they will collect money for fund when they get funding request.

COMMENTS: Nevada is a very rural state, and it still has some rural residents with toll station service and some party line customers (300-350). Providing US is clearly a staff objective, especially to rural areas.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The Commission doesn't regulate cable. Small direct TV dishes are more likely solution in rural areas than is cable.

Programs to access advanced information services:

Programs for electronic access to public/government records: The states's Department of Information Services (702-687-4091) is working on this. The Commission currently has access to the Internet, but their information is not currently provided on the Internet.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

University and Community College System of Nevada, (UCCSN) will create a system of information brokers who will train end users in remote, rural communities to find and use on-line resources, creating a human infrastructure for end user support. Members of ten rural communities will be empowered to be brokers of on-line user support services that already exist in their community. Local dial-up access will also be provided in the communities served (Total $881K, Federal $427K).

NEW HAMPSHIRE

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Concord, New Hampshire 03301-7319
(603) 271-2431 Fax: (603) 271-8828

STATE DEMOGRAPHICS

Population: 1,125,000
Size: 9,283
Proportion rural: 49.0%
Population per sq. mile: 125.5
Median household income: $39,644
Percent below poverty: 8.6%
Percent on public assistance: 3.4%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 660,804
Number of LECs: 14
BOC: NYNEX
Market share of BOC: 93.8%
Penetration Rate: 95.8%
LEC competition permitted: 8/95

OPASTCO STUDY

Subscribers per sq. mile: 30.9
Difference in non-BOC loop costs: 5.7%
Monthly revenues per customer: $11.20
Revenues if supports eliminated: $22.04
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 12.92%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 73.0%
Cable in schools: 46.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $18.00
LEC residential rates: $6.00 to $9.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) in the initial stage of the rule making process
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: NHPUC has a docket on local competition (DRM 9591) and they are currently doing background research. They have a mandate to finish by the end of 1996. The definition of basic service is not an issue in NH since all LECs are updated. They don't believe they need to define a higher standard than is currently in place. Target groups also are not real issue in NH. There is no evidence that LECs need a USF because they currently have adequate capital and earnings. But the need for a USF will have to be considered in the rule making process. Any USF would be revenue neutral and would apply to all carriers. They will have to realign rates soon so rates match costs -- urban rates need to come down and rural rates need to go up. Fiber in interoffice connections and digital switching have reduced the difference between rural and urban telephone service.

COMMENTS: US is less of an issue in NH than other states. They are in a state of change. They don't want to set up a USF until they see what happens in market. They don't need a USF now, and they hope to benefit from the experience of other states. NH doesn't participate in Lifeline because of the matching funds required.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: Local call access to Internet is a big problem in certain areas of the state. There are large rural areas without toll free access. The NHPUC has a docket that may expand local calling areas to address this problem. There is also pressure from the education system to get free Internet access and distance learning. Schools want the phone company to subsidize access and equipment. The Postsecondary Technical Education Department (PSTE) currently contracts for Internet access with NEARNET. Both the state library and the Department of Education have implemented Internet access through the PSTE connection.

Programs for electronic access to public/government records: The NHPUC has a Web page, and they are moving to make Commission orders available. The state is also considering alternatives to allow electronic access to state and federal government information. Public access may be serviced and billed monthly by the local telephone service carrier.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Children's Alliance of New Hampshire, Inc. - Benefits Access Network. SafetyNet will increase access to public and private assistance programs for children, families, and individuals of all ages in the state of New Hampshire through the use of computer networking technologies. Benefit Outreach Screening Software (BOSS), a new software program, will offer families an on-screen questionnaire, determine eligibility, and generate completed application forms for those services (Total $207K, Federal $83K).

NEW JERSEY

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New Jersey Board of Public Utilities
Two Gateway Center
Newark, New Jersey 07102
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STATE DEMOGRAPHICS

Population: 7,879
Size: 8,215
Proportion rural: 10.6%
Population per sq. mile: 1,062.0
Median household income: $39,227
Percent below poverty: 10.0%
Percent on public assistance: 6.1%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 5,212,937
Number of LECs: 3
BOC: Bell Atlantic
Market share of BOC: 96.9%
Penetration Rate: 93.9%
LEC competition permitted: under consideration

OPASTCO STUDY

Subscribers per sq. mile: 387.2
Difference in non-BOC loop costs: 42.6%
Monthly revenues per customer:
Revenues if supports eliminated:
Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.98%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 77.0%
Cable in schools: 79.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $7.00 - 8.00
LEC residential rates: $5.30 to $7.80

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: Single party, multi-party, rotary, voice grade line, 911, white page listing, long-distance service, repair service, privacy protection

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: Nothing is currently pending regarding US in New Jersey. The Board is initiating an investigation into local competition. A generic proceeding on US is forecasted for the future and rule making may occur at that time.

COMMENTS: Telephone rates in NJ have remained one of the lowest in the country making service affordable to most customers.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: There is a cooperative distance learning project with the New Jersey Institute of Technology, Burlington County College, and OTIS to provide classroom presentations remotely via the Garden State Network.

Programs to access advanced information services: Kiosks are being installed throughout the state to enhance public access to information. Anticipated uses are travel and tourism, employment opportunities, and motor vehicles.

Programs for electronic access to public/government records: Internet access is expanding with a number of agencies expressing interest in both access and providing information to the Internet. A web server has been installed for this use, and a coordinated home page is in development. The intent is to present a single image of the state on the Internet.

Public/private partnerships: See Mercer CCC/MercerNet below.

1995 NTIA/TIIAP GRANTS

Newark Board of Education, in a partnership with the New Community Corporation and the University of Medicine and Dentistry - New Jersey, will expand its Making Healthy MUSIC project by extending access to a greater number of residents in an inner-city neighborhood in Newark. The primary goal is to improve the delivery of primary health care to community residents by empowering the community to manage their own health issues (Total $180K, Federal $100K).

Mercer County Community College. MercerNet is a 14 member consortium that will use Comcast Cablevision to build an interactive wide area network (WAN) to link eight specially equipped high school classrooms, a science center, a vocational-technical school, nine libraries and the community college. The network will provide interactive television for distance learning, access to the Internet, and an interface for multimedia video (Total $2,623K, Federal $700K).

NEW MEXICO

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New Mexico State Corporation Commission .
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(505) 827-4496 Fax: (505) 827-4417

STATE DEMOGRAPHICS

Population: 1,616,000
Size: 121,598
Proportion rural: 27.0%
Population per sq. mile: 13.3
Median household income: $26,158
Percent below poverty: 21.0%
Percent on public assistance: 8.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 752,959
Number of LECs: 14
BOC: US West
Market share of BOC: 86.0%
Penetration Rate: 88.6%
LEC competition permitted: 1985

OPASTCO STUDY

Subscribers per sq. mile: 0.5
Difference in non-BOC loop costs: 104.7%
Monthly revenues per customer: $16.26
Revenues if supports eliminated: $63.22
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 99.02%
Other Technology: BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 57.0%
Cable in schools: 58.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $10.96 to $15.86
LEC residential rates: $10.96 to $15.86

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost, Low income/economically disadvantaged
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Commission established board
Contributors: No one now but everyone was suppose to
Basis for contribution: Revenues
Types of subsidies: Rate subsidy
Who draws from fund: No one is currently drawing from the fund
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** No

PENDING ACTIONS: They will be opening a docket on local competition which may involve US. USF will most likely be targeted to high cost and will involve a rate subsidy. There are no official rate cases currently but US West wants rate rebalancing -- to increase residential and lower business rates.

COMMENTS: New Mexico doesn't have US.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The NM SCC has the authority to regulate two-way voice and data.

Programs to access advanced information services: US West is installing ISDN lines that will make it possible. With improved infrastructure, advanced information services may become a reality.

Programs for electronic access to public/government records: Corporation Commission data is available on the Internet

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Cooperative Educational Services Albuquerque is a joint planning grant for small and remote rural communities to create an infrastructure development plan that provides a road map for information highway access that is affordable, sustainable and reflective of community needs and interests (Total $33K, Federal $16K).

University of New Mexico - University Affiliated Program/Training Unit, UNM Health Sciences Center working in partnership with rural NM communities and state agencies, will use grant funds to develop a multilevel interactive telecommunications model project called TeleCommunity HELP: Health Education Links Project. The project will provide health and education related support for five rural, underserved communities in NM (Total $530K, Federal $245K).

Santa Fe Community College. This project will determine how telecommunications can help solve problems in the fields of health care and education in locations where there is limited access to a wide range of government and social services (Total $50K, Federal $24K).

La Plaza Telecommunity Foundation, Inc. will set up an electronic plaza in the rural Taos region, where students, seniors, Hispanics, Native Americans, Anglos, and others can meet, communicate, and get information important to their daily lives. La Plaza will provide access to the arts, education, government, health care, business and other information and communication resources free of charge for everyone via public access computers and dial-in connections (Total $2,551K, Federal $450K).

NEW YORK

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STATE DEMOGRAPHICS

Population: 18,197,000
Size: 53,989
Proportion rural: 15.7%
Population per sq. mile: 385.3
Median household income: $31,254
Percent below poverty: 15.3%
Percent on public assistance: 9.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 10,623,181
Number of LECs: 40
BOC: NYNEX
Market share of BOC: 89.8%
Penetration Rate: 93.5%
LEC competition permitted: 1992

OPASTCO STUDY

Subscribers per sq. mile: 21.8
Difference in non-BOC loop costs: 3.3%
Monthly revenues per customer: $16.33
Revenues if supports eliminated: $26.15
Percent who would disconnect: 12.90%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 8.41%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 63.0%
Cable in schools: 62.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.45 - $22.27
LEC residential rates: $3.84 to $17.92

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: None
Definition of basic service: Touch tone, exchange access, statewide relay, non-published service, and direct inward dialing (see pending)

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: DPS has a docket on local competition, and one part of it involves US. Staff is recommending changes in basic service to include voice grade line, tone dialing, access to local/toll calling, emergency services, operator/directory assist., statewide relay service, directory listing, privacy protection. Two types of programs are to be funded - social programs ("Targeted Accessibility Fund") and high cost ("High Cost Fund"). Every state regulated telecommunication provider will contribute to USF based on each providers revenues. The "TAF" fund distribution will be based on subscription levels of targeted groups. The "HCF" fund distribution will be based on each providers revenues. The fund should be administered by an independent third party. They have a number new local carriers and applications, and some cable companies have applied. NYNEX and RTC have their rates are frozen for 5 years, so rates will be flat for 95% of the state. Rates for the 5% smaller LECs may rise.

COMMENTS: New York has US today except for some pockets. The DPS is looking at the best way to maintain US in the future. SBC has received authority from the PSC for its Southwestern Bell Mobile Systems subsidiary to provide local telephone service in Rochester.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The Cable Commission is being eliminated and its functions are being placed under the Public Service Commission. Cable companies are seeking certification. The state is composing a strategic plan to deploy video conferencing in government agencies.

Programs to access advanced information services: A number of telephone companies are providing local access to Internet. PSC may expand the definition of basic service later to include advanced information services.

Programs for electronic access to public/government records: There is nothing being mandated, but the Public Service Commission will go on the Web in February 1996.

Public/private partnerships: They are looking at ways to use public/private partnerships to build ISDN lines for all schools and to provide discounted rates to schools. The New York Thruway approved a 20 year agreement to allow MFS Network Technology to build a fiber optic network along the toll road system. The state will receive 20% of the gross revenues and stimulation to state-wide economic development as the fiber infrastructure is made accessible to communications carriers.

1995 NTIA/TIIAP GRANTS

NY State Office for the Aging Policy and Program Development. The NY State Office for the Aging and its network of Area Agencies on Aging (AAAs), in partnership with the Administration on Aging, the Social Security Administration, NYSERNet, IBM, NYNEX, and others, will develop the Aging Services Network (ASNet). Fifty-nine Area Agencies on Aging will receive full Internet access. This project will create a new system - Client Based Service - that brings together many existing databases in a coherent manner (Total $3,786K, Federal $1,249K).

Bronx Community College Continuing Education. The Bronx GATEWAY, a consortium of 47 providers, will get information about employment opportunities, job training programs, education programs, and city and state services to people who desperately need it and serve as a tool for economic and social development in the Bronx (Total $113K, Federal $55K).

Beth Israel Medical Center Chemical Dependency Institute. This project will provide 23 Methadone Maintenance Treatment Programs (MMTP) video conferencing access to link nurses and para-professionals with senior physicians to ensure appropriate diagnosis and referral (Total $1,369K, Federal $650K).

Community School District #4 Office of Funded Programs. This grant will provide students in 13 inner-city NY schools with access to computer, information, and Internet technologies (Total $871K, Federal $225K).

Otsego County Chamber of Commerce. The OtsegoNet Social Service will provide county residents with equitable and affordable access to the entire range of information resources of a fully networked community. Currently, less that 1% of the population has local Internet access (Total $622K, Federal $225K).

NORTH CAROLINA

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STATE DEMOGRAPHICS

Population: 6,945,000
Size: 52,672
Proportion rural: 49.6%
Population per sq. mile: 142.6
Median household income: $27,835
Percent below poverty: 15.7%
Percent on public assistance: 7.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 3,672,712
Number of LECs: 20
BOC: Bell South
Market share of BOC: 50.3%
Penetration Rate: 92.8%
LEC competition permitted: 1995

OPASTCO STUDY

Subscribers per sq. mile: 30.0
Difference in non-BOC loop costs: -13.7%
Monthly revenues per customer: $19.07
Revenues if supports eliminated: $23.94
Percent who would disconnect: 4.30%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 23.00%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 61.0%
Cable in schools: 68.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $9.94 to $13.94
LEC residential rates: $2.56 to $18.26

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: NC House Bill 161 is on local competition. The NCUC has established a docket on competitive local service (P-100, Sub 133) which will address the issue of US in June of 1996. Interim rules are to be in place by 12/31/96 and final rules by 7/1/98. In the interim rules, basic service is defined as single party, touch tone, voice grade line, and flat rate local calling. Target groups will be part of the docket, but not interim rules. Interim rules said the Commission should consider need and the type of subsidy, but that they will establish a USF. They have no pending rate cases.

COMMENTS: NC has universal service -- telephone service is available statewide at affordable rates to all, and all service is single party.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: One cable provider has applied for certification and will use cable for telephone transmission. Other cable companies will be seeking certification to provide local competitive service.

Programs to access advanced information services: North Carolina Information Highway (NCIH) includes SONET/ATM which is a broadband network delivering two way interactive video and advanced data communications services. There are approximately 132 operational sites with a planned expansion in the coming year. The NCIH uses fiber-optic phone lines and state of the art switching technology to transmit data, voice, and video faster than ever. Eventually every citizen will have access through a local public library. Private industry is expected to account for 75% of use by 1999.

Programs for electronic access to public/government records: The Department of Administration is working on this (919) 733-6887. Some state agencies are providing access, but it is not a statewide program.

Public/private partnerships: The use of public/private partnerships may come up in the current docket. NC has not relied on pubic/private partnerships in the past.

1995 NTIA/TIIAP GRANTS

Land-of-Sky Regional Council MAIN Board of Directors. The Mountain Area Information Network (MAIN) will bring information resources to the twenty-two isolated and economically depressed counties of Western NC. Only two of these counties have local Internet access despite the growth of the NC Information Highway. In addition to distance education, the network will also provide valuable agricultural data, weather information, economic information, child development instruction, as well as access to an on-line library (Total $3,119K, Federal $800K).

Public Library of Charlotte and Mecklenburg County. Charlotte's Web is a free access, interactive, multimedia, regional network, created by the Public Library of Charlotte and Mecklenburg County and a broad coalition of public and private agencies, for information, education, and communication. Charlotte's Web will demonstrate new ways of hooking up rural communities at low-cost, using a "mini-hub" of donated 286 computers (Total $1,280K, Federal $500K).

North Carolina State University. The NC University Libraries will deploy a model system for interlibrary loan and document ordering and delivering to students, faculty and staff. At the heart of the project is an intelligent system capable of receiving requests from authorized users anywhere on the Internet, determining available suppliers, and delivering documents electronically or physically (Total $475K, Federal $188K).

Southern Rural Development Initiative. Twenty-four SDRI Consortium members will participate in the development of a plan to provide affordable access to information resources for small and minority farmers and businesses (Total $471K, Federal $210K).

NORTH DAKOTA

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STATE DEMOGRAPHICS

Population: 635,000
Size: 70,704
Proportion rural: 46.7%
Population per sq. mile: 9.2
Median household income: $27,105
Percent below poverty: 11.9%
Percent on public assistance: 4.3%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 337,998
Number of LECs: 29
BOC: US West
Market share of BOC: 71.6%
Penetration Rate: 96.3%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile: 1.4
Difference in non-BOC loop costs: 48.6%
Monthly revenues per customer: $14.22
Revenues if supports eliminated: $38.45
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 84.82%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 61.0%
Cable in schools: 58.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.00
LEC residential rates: to

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statute, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: Essential services are defined in statute.

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Nothing is pending regarding US, and the NDPSC has no rate of return jurisdiction over telecommunications. They have a list of essential services but not basic services. They have had no rate cases in the last 10 years. Cooperatives and small independents are exempt from all regulation except price caps (or rate of return if elected) for access. US West is price-capped for educational services.

COMMENTS: The situation is very different in ND than in any other state since telecommunications is only marginally regulated in the state. So, the PSC can't do much about US until the law is changed to give the them regulatory authority. PSC does have authority to grant or deny certificates of public convenience and necessity over all telecommunication companies, and service quality over US West and some LECs.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: ND completed a study looking at the need for advanced information services, but nothing is going on now.

Programs for electronic access to public/government records: Several state agencies are on the Internet, but it is not a formalized process.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Minot State University - North Dakota Center for Disabilities. MSU will develop a communications network that will make training, human services, and research available to some of the most isolated residents of rural North Dakota. They are developing a computer wide area network, comprised of seven sites connected to MSU. Sites include the local schools in seven small communities, which are often the focal point for the community (Total $1,600K, Federal $800K).

OHIO

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STATE DEMOGRAPHICS

Population: 11,091,000
Size: 44,828
Proportion rural: 25.9%
Population per sq. mile: 270.8
Median household income: $31,479
Percent below poverty: 12.4%
Percent on public assistance: 8.7%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 5,625,041
Number of LECs: 42
BOC: Ameritech
Market share of BOC: 58.9%
Penetration Rate: 94.6%
LEC competition permitted: 8/95

OPASTCO STUDY

Subscribers per sq. mile: 17.8
Difference in non-BOC loop costs: 29.3%
Monthly revenues per customer: $18.31
Revenues if supports eliminated: $21.88
Percent who would disconnect: 4.30%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 96.88%
Other Technology: ISDN

ADVANCED TELECOMMUNICATIONS

Cable households: 65.0%
Cable in schools: 77.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $15.25
LEC residential rates: $2.70 to $22.90

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: None
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: OPUC has an open docket on local competition with US as a key issue in the docket. Staff is now awaiting comments. The staff has proposed that basic service include single party, touch tone, voice grade, 911, directory assistance, operator assistance, white page listing, long distance, modem grade (14400), repair service, privacy protection, usage packet of 400 minutes, and telecommunication relay services. The target for the US program would be residential subscribers in high cost areas. Economically disadvantaged are taken care of through the Federal programs. In staff recommendations, contributors would include all carriers of local service including cellular and paging companies, and contributions would be based on total intrastate revenues from the past year. Disbursements would go to carriers, not end users. Any carrier serving residential subscribers in high cost area could draw from the USF. They will develop benchmark costs. Carriers' subsidies would be based on the number of lines. Small carriers could get dollar for dollar subsidy, if they reduce access charges. They haven't decided who should administer the fund. Ameritech went to deaveraging of rates. In two years or less, Ohio will have local competition, and in those competitive areas rates may be lower.

COMMENTS: Ohio is committed to the goal of US and is contemplating specific regulations for Ohio. The OPUC recognizes that most citizens do have access. They want to make sure they will continue to have access under the new competitive environment.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: People are becoming more dependent on advanced information services, but the commission doesn't want to over regulate. Access to advanced information services may take care of itself. The issue for OPUC is when to get involved. Ohio SchoolNet is "Ohio's commitment to bring telecommunications and computer technology to the classroom over the next five years." The plan is to wire every classroom to allow for voice, video, data, and interactive distance learning.

Programs for electronic access to public/government records: Some state agencies are putting information on the Internet, and a recent state report recognized this need, but nothing formal is in place now. Access would probably occur through libraries.

Public/private partnerships: Some carriers have implemented educational and distance learning programs.

1995 NTIA/TIIAP GRANTS

Appalachian Center for Economic Networks. ACENet is a community-based on-line system providing Internet access and local and regional information to community members. The grant will enable three groups to access to new information technologies: people moving from welfare to work; small manufacturing firms participating in flexible manufacturing networks; a community-based support organizations (Total $208K, Federal $90K).

Franklin County Department of Human Services Employment Consortium. JOB-LINK is an innovative training, outreach, and information sharing program that will use standard information processing and Internet tools. Specifically, the project will create a shared electronic database on job seekers, training, and employment opportunities; fourteen community access points and a central training classroom; and a program to instruct and train job seekers in basic computer literacy (Total $591K, Federal $289K).

National Emergency Number Association. NENA plans to develop and maintain a highly accurate, interactive database of Public Safety Answering Points, commonly know as 911 centers, to identify areas of the country where 911 is not available, and then help those states and counties implement the service (Total $133K, Federal $66K).

OKLAHOMA

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STATE DEMOGRAPHICS

Population: 3,231,000
Size: 69,903
Proportion rural: 32.3%
Population per sq. mile: 47.1
Median household income: $25,363
Percent below poverty: 18.4%
Percent on public assistance: 6.4%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,632,674
Number of LECs: 47
BOC: Southwestern Bell
Market share of BOC: 82.5%
Penetration Rate: 93.3%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile: 4.6
Difference in non-BOC loop costs: 70.2%
Monthly revenues per customer: $13.94
Revenues if supports eliminated: $33.84
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.70%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 60.0%
Cable in schools: 62.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $9.50-$13.00
LEC residential rates: $5.00 to $20.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: Single party, touch tone, 911, white pages, modem capable, custom call feature

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: There is no specific mandate for US, but US is a general principal/concept embraced by the Commission. They have a docket on local competition and draft rules (RM9500019). US and a USF are part of this docket. They are looking at creating a USF to ensure rates are affordable. In the revised draft rules they will add directory and operator assistance to the definition of basic service. They also have a docket on access charges which may require the establishment of a separate high cost fund. All telecommunication service providers will contribute to both funds and this may eventually include cellular providers. The funds will be administered by a 3rd party. The basis for determining carriers contributions to the USF has not been determined. For the high cost fund the assessment will be based on minutes of use. The high cost fund will provide a rate subsidy to carriers based on a Commission benchmark rate of return. They have not developed the mechanism for the USF. In a recent GTE rate case, the Commission reduced GTE's rates eliminating touch tone charges and mileage charges. They have certified a new carrier and another is applying. They expect that rates will stay flat in the future.

COMMENTS: Currently OK has a high level of telephone service. Carriers are improving technology, and they will continue to bring in new technology as the market expands. It is hard to predict the effects of local competition on the introduction of new information technology . OK is beginning to position itself for the new competitive environment.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: Oklahoma is trying to make sure all schools have access to Internet. Oklahoma OneNet is a digital voice, data and video network designed to utilize a combination of Public/private facilities. One Net will link schools, hospitals, libraries, and government offices to the Internet. $6.6M in bond money is funding the first regional hub site location.

Programs for electronic access to public/government records: Oklahoma is putting government information on line and have provided grant money to do some trial programs. They are also putting a number of kiosks into the community to provide access to government agencies.

Public/private partnerships: SW Bell will fund Internet access and infrastructure upgrades to schools as part of their recent rate case.

1995 NTIA/TIIAP GRANTS

Oklahoma Department of Commerce will provide advanced telecommunication services to 15 rural communities in Oklahoma. Children in public school will have access to the Internet and the WWW for homework assignments. Specialized services such as teleradiology and video conference calls will give residents access to higher quality medical care (Total $9,836K, Federal $1,495K).

OREGON

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STATE DEMOGRAPHICS

Population: 3,032,000
Size: 97,093
Proportion rural: 29.5%
Population per sq. mile: 31.6
Median household income: $32,114
Percent below poverty: 11.3%
Percent on public assistance: 5.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,611,579
Number of LECs: 33
BOC: US West
Market share of BOC: 69.0%
Penetration Rate: 96.2%
LEC competition permitted: 1993

OPASTCO STUDY

Subscribers per sq. mile: 2.9
Difference in non-BOC loop costs: 21.4%
Monthly revenues per customer: $15.99
Revenues if supports eliminated: $29.31
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 98.63%
Other Technology: BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 60.0%
Cable in schools: 72.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.80
LEC residential rates: $8.00 to $16.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost, Low income/economically disadvantaged
Definition of basic service: Single party, touch tone, voice grade, 911, directory assistance, operator assistance, white pages, long distance, toll blocking, relay services

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: LEC Assoc. (OECA)
Contributors: All telecommunication providers (LECs, BOC, IXCs)
Basis for contribution: Percent of gross revenues
Types of subsidies: Rate subsidy, Direct infrastructure reimbursement
Who draws from fund: LECs who show a cost shift would cause residential rates to exceed $15.00
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: OPUC has completed Phase I of the docket. Phase II of the docket will create the specific mechanisms to fund the program, putting the commission's order to work. Phase II will also establish programs for low income, adding two other categories to OR's US program (Category 1 is their current program). Categories 2 and 3 will be or low income. In these programs, the customer will receive a subsidy based on a maximum monthly charge set by the Commission. Category 2 and 3 subsidies are portable. Eligibility criteria for these programs will be part of Phase II. Pending legislation may also add radio common carriers as contributors to the USF. In addition, there is currently a proposal in front of commission to adopt a policy to eliminate the distinction between "use" and "user". This could lead to equalization of rates for business and residential service.

COMMENTS:

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: Local call access to the Internet is not addressed in the current docket, but the Commission might revisit this issue in two years. The Oregon Telecommunications Forum held 21 regional meetings throughout the state for intensive discussion of telecommunication issues. Connectivity, training and ongoing support requirements are being assessed in preparation for issuing a statewide contract for Internet access. Oregon has established a Governor's Office of Telecommunications, the contact is Lori Itkins.

Programs for electronic access to public/government records: The Department of Administrative Services is working on setting up pages on the Web for state agencies.

Public/private partnerships: Oregon has used public/private partnerships to provide Internet access in libraries. State Bill 994, 1995 gave the Telecommunications Section responsibility to coordinate the consolidation and operation of telecommunications systems used by all state agencies, including emergency services networks.

1995 NTIA/TIIAP GRANTS

Columbia River Inter-Tribal Fish Commission. CRITFC will plan the development of a community network to link Indian tribes in the Columbia River basin. This grant will enable the tribes to develop the technical specifications for a system to meet a variety of telecommunication needs, including management of the fisheries of the Columbia River System (Total $77K, Federal $46K).

Portland Public Schools, District No. 1. The Community Access/Telecommunications Services Project is designed to provide local and enhanced access to community and governmental services. The resulting network will then be used to provide adult education classes; basic adult literacy programs; health, nutrition and other services for senior citizens; a telecommunications skills enhancement program for K-12 students; and access to city, county, and school district on-line services (Total $1,170K, Federal $450K).

Salem Public Library. This project will develop an electronic information network, the Oregon Public Electronic Network, designed to enhance the exchange of information between government and citizens and to provide the infrastructure for regional businesses and organizations to market their products and services via the WWW (Total $482K, Federal $232K).

State of Oregon Governor's Office will develop a comprehensive statewide infrastructure plan to provide all residents of Oregon with the benefits of advanced communications and information services and will implement recommendations from the 1994-95 Oregon Telecommunication Forum (Total $432K, Federal $204K).

PENNSYLVANIA

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STATE DEMOGRAPHICS

Population: 12,048,000
Size: 45,759
Proportion rural: 31.1%
Population per sq. mile: 268.8
Median household income: $29,985
Percent below poverty: 11.7%
Percent on public assistance: 6.9%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 6,777,520
Number of LECs: 38
BOC: Bell Atlantic
Market share of BOC: 77.4%
Penetration Rate: 97.2%
LEC competition permitted: no (yes, informally)

OPASTCO STUDY

Subscribers per sq. mile: 36.9
Difference in non-BOC loop costs: 31.9%
Monthly revenues per customer: $12.09
Revenues if supports eliminated: $24.96
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.20%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 72.0%
Cable in schools: 61.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $8.20-12.95
LEC residential rates: $3.25 to $17.73

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: Rural/high cost
Definition of basic service: Single party, touch tone, voice grade, 911, directory assistance, operator assistance, white pages, long distance, disability service, access to incoming and outgoing calls

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost :** Yes

PENDING ACTIONS: The PPUC has three US dockets, one is on the record (I-00940035). They expect to have their US policy in place by summer 1996. The program will focus on high cost, since Lifeline takes care of low income. A second docket will address the US funding mechanism. All telecommunication providers they have jurisdiction over will contribute to the fund including resellers. Cellular is not included now, but may be add later. Contributions to the fund will be based on the carriers share of total intrastate revenues (business and residential). Rate subsidies will be paid to any carriers, if they provide local service. The formula for distributing funds is currently being developed. The USF will be administered by a independent third party. They may address US for low income groups later. The PPUC has no rate cases pending, and recently certified four new LECs.

COMMENTS: PA is committed to US, and the PPUC has put US on the front burner to move PA forward into the new competitive environment. They believe one of the purposes of US is to create competition, and that PA's US program should stimulate competition in rural areas.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The Pennsylvania Rural Health Telecommunication Network (PA HealthNet) provides 2-way video and audio exchange of information for health care delivery purposes including examination, diagnosis, consultation, and treatment. As part of PAHealthNet, physicians in rural areas are linked with other physicians using desktop video.

Programs to access advanced information services: The commission is discussing what should be included in US as part of the rule making process. Pennsylvania is making its private voice network (PANET) available to all 501 schools districts and 29 intermediate units for distance learning programs.

Programs for electronic access to public/government records: This has been a priority, and the Commission has a bulletin board that is accessible to the public.

Public/private partnerships: As part of regulatory reform, Bell has to hook up schools and hospitals to advanced information services.

1995 NTIA/TIIAP GRANTS

National Adoption Center. The National Adoption Exchange will provide Internet access to its existing bulletin board and database system, giving NAE users instant access to adoption information, without searching, and providing them with a gateway to other on-line computer networks (Total $231K, Federal $116K).

Research for Better Schools. RBS will create the Mid-Atlantic Telecommunications Alliance (MATA), a multi-state consortium of business and educational stakeholders, to plan for more equitable student/teacher access to Internet resources. MATA will focus on high-need urban and rural schools (Total $278K, Federal $135K).

University City Science Center LibertyNet will apply telecommunication technology solutions to community development in the region's Empowerment Zone. Five computing centers will have at least ten computers with the capability to search the network. They are designed to promote reinforcement of learning among low income residents by developing telecommunication technology skills, providing opportunities to participate in community life, and connecting them with job information (Total $853K, Federal $400K).

Allegheny-Singer Research Institute. The Allegheny Health, Education and Research Foundation will use grant funds to enhance its telemedicine health care applications through an advanced telecommunication network for real-time sharing of medical information among urban-rural partners. The program will permit remote diagnosis and treatment of patients in outlying, rural areas; medical image distribution; continuing medical education and support of rural physicians and medical students at multiple sites; and on-line medical research and library, e-mail and Internet access (Total $1,129K, Federal $450K).

Borough of Munhall Department of Police. The Technology Utilization Pilot Project for Enhancing Resources (TUPPER) is a cooperative project between seven municipalities' police departments to provide a more visible community police presence and afford greater access to investigative information and data for police officers (Total $102K, Federal $50K).

RHODE ISLAND

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STATE DEMOGRAPHICS

Population: 1,000,000
Size: 1,231
Proportion rural: 14.0%
Population per sq. mile: 956.9
Median household income: $30,636
Percent below poverty: 12.0%
Percent on public assistance: 8.0%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 550,593
Number of LECs: 1
BOC: NYNEX
Market share of BOC: 100.0%
Penetration Rate: 96.2%
LEC competition permitted: yes

OPASTCO STUDY

Subscribers per sq. mile:
Difference in non-BOC loop costs:
Monthly revenues per customer:
Revenues if supports eliminated:

Percent who would disconnect:

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 9.57%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 69.0%
Cable in schools: 80.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $7.50-$22.00
LEC residential rates: $7.50 to $22.00 (one LEC)

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** No **High Cost:** No

PENDING ACTIONS: RI PUC has a docket on local competition but has nothing pending on US. They have low loop costs because of the density of the state. Consequently, US has not been an issue in the state and they do not participate in the Federal High Cost program. RI has one LEC, and no new carriers have applied for certification.

COMMENTS:

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services:

Programs for electronic access to public/government records: The PUC is starting a bulletin board to provide information and services on the Internet.

Public/private partnerships: Rhode Island has established a library network system for sharing and interlibrary cooperation.

1995 NTIA/TIIAP GRANTS

None.

SOUTH CAROLINA

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South Carolina Public Service Commission
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Columbia, South Carolina 29211
(803) 737-5105 Fax: (803) 737-5199

STATE DEMOGRAPHICS

Population: 3,643,000
Size: 31,189
Proportion rural: 45.4%
Population per sq. mile: 121.0
Median household income: $27,667
Percent below poverty: 18.9%
Percent on public assistance: 6.7%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 1,731,751
Number of LECs: 28
BOC: Bell South
Market share of BOC: 67.6%
Penetration Rate: 87.7%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile: 25.8
Difference in non-BOC loop costs: -18.4%
Monthly revenues per customer: $18.37
Revenues if supports eliminated: $24.80
Percent who would disconnect: 4.30%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 25.01%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 59.0%
Cable in schools: 53.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $14.20 - $16.90
LEC residential rates: $3.00 to $16.90

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: SC PSC has a task force looking at local competition that will address US. They are just forming this task force. The task force will consider a definition for basic service and US funding mechanisms. They have no rate cases pending, but there is an earnings review underway to determine if there are excess earnings.

COMMENTS: SC has a good penetration rate but the PSC will be examining issues related to US and a USF as the state moves into local competition.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The PSC doesn't regulate cable, and no cable providers have applied for certification. Some cable companies have been involved in their proceedings. Four AT&T Vistium desktop video units are being ordered and will be used by the Department of Mental Health to evaluate the use of this technology for interactive sessions with clients in remote locations.

Programs to access advanced information services: Advance information services are not likely to be part of task force's deliberations. It's not an issue, and local exchange companies are trying to make access easier. The state government is also trying to connect libraries to the Internet.

Programs for electronic access to public/government records: The development of a state home page is near completion. Providing access to data/information contained within state government is critical to the success of the network. South Carolina has received some grants to develop local area networks so consumers can have access to government agencies.

Public/private partnerships: Bell South has offered discounted rates to school for access to Internet. Two telemedicine projects are currently underway to evaluate the use of this technology to improve rural health care. Applications being evaluated include consultations, tele-radiology, health education, LAN connectivity, etc. Local exchange carriers are participating in these projects by providing T-1 facilities.

1995 NTIA/TIIAP GRANTS

Office of Information Resources. This project will establish statewide connectivity to the state's forty-six counties and to the ten Councils of Government and to the municipal associations, association of counties in addition to connection to the central network HUB (1994 NTIA/TIIAP grant, Federal $430K).

Piedmont Technical College Academic Affairs. The Piedmont region of SC will create a telecommunication network and lease a fiber optic "backbone" network from six different telephone companies. The resulting network will connect 17 fully interactive video classrooms, delivering a wide variety of educational offerings. This network will also connect to other statewide networks and the Internet (Total $744K, Federal $225K).

SOUTH DAKOTA

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South Dakota Public Utility Commission
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Pierre, South Dakota 57501
(605) 773-3201 Fax: (605) 773-3809

STATE DEMOGRAPHICS

Population: 715,000
Size: 77,121
Proportion rural: 50.0%
Population per sq. mile: 9.4
Median household income: $26,351
Percent below poverty: 14.8%
Percent on public assistance: 4.6%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 355,257
Number of LECs: 31
BOC: US West
Market share of BOC: 77.6%
Penetration Rate: 94.8%
LEC competition permitted: yes

OPASTCO STUDY

Subscribers per sq. mile: 1.4
Difference in non-BOC loop costs: 65.5%
Monthly revenues per customer: $11.85
Revenues if supports eliminated: $28.20
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 66.30%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 59.0%
Cable in schools: 49.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.00 to $15.20
LEC residential rates: $5.25 to $15.75

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) in initial stage of rule making process
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: SDPUC has nothing pending on US. They don't expect to do anything on US unless the Federal programs are changed. US West has requested price regulation for non-competitive products, and will upgrade infrastructure if their request is granted.

COMMENTS: Based on coverage of 96% of the state, US is not an issue in SD. Areas lacking US have improved dramatically. Local competition is currently an issue in SD.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable providers have applied for certification as telecommunication providers. The RDT Network has 79 satellite downlinks located in high schools across the state. They will be able to broadcast from any of 18 interactive sites or turn around broadcasting from anywhere in the world and resend it to any or all downlink locations.

Programs to access advanced information services: In the current rate case, US West would provide local call access to the Internet throughout US West's exchange area (75% of the state). The PUC hosts an Internet Web page with limited background and news.

Programs for electronic access to public/government records:

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

City of Aberdeen. Dakota Interconnect will use fiber optic and microwave technologies to link existing networks and future networks with compatible audio, video, and data connections. Included in this infrastructure are distance learning clusters, encompassing eight school districts in a three county area; a data connection, through the local cable company, among local government, educational institutions, and non-profit organizations; and a statewide two-way interactive video conferencing network (Total $2,472K, Federal $900K).

Mni Sose Intertribal Water Rights Coalition, Inc. This group represents 23 Indian tribes located in five states. Through this grant they will develop a plan to build a communications network that will link the tribes to each other, as well as to critical state and governmental information concerning water and other natural resource management (Total $344K, Federal 233K).

TENNESSEE

Contact: Dr. Chris Klein, Director of Utility Rate Division.
Tennessee Public Service Commission
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STATE DEMOGRAPHICS

Population: 5,099,000
Size: 42,145
Proportion rural: 39.1%
Population per sq. mile: 123.7
Median household income: $24,339
Percent below poverty: 17.0%
Percent on public assistance: 8.6%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,695,772
Number of LECs: 18
BOC: Bell South (80%) of state
Market share of BOC: 80.5%
Penetration Rate: 92.8%
LEC competition permitted: 1995

OPASTCO STUDY

Subscribers per sq. mile: 16.0
Difference in non-BOC loop costs: -1.7%
Monthly revenues per customer: $16.67
Revenues if supports eliminated: $22.83
Percent who would disconnect: 4.30%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 19.96%
Other Technology: ISDN

ADVANCED TELECOMMUNICATIONS

Cable households: 61.0%
Cable in schools: 67.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $7.50 - $12.15
LEC residential rates: $6.00 to $13.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) actively involved in rule making process
Targeted Groups: None
Definition of basic service: Touch tone, voice grade line, emergency services, white page listing, access line, telecommunication relay services, and educational discounts

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The TPSC established a proceeding on local competition and is in the process of developing rules on US as part of that case. The Commission has to issue an order by 1/1/96. What groups to target for US is an issue in the case. They are looking at US funding mechanisms and expect that all telecommunication service providers will contribute to the fund, including LECs and long-distance carriers, but not cellular. They aren't sure there will a USF, and if there is it won't be in place until 1997. They want to keep rates at current levels. The TPSC is going through a review of rates for Bell South. Over the next four years prices will be flat under new regulations, after that rates may increase.

COMMENTS: US hasn't been a problem in the past because they had low residential rates and access was not a problem. The TPSC is in the process of investigating the cost of US and need for a USF.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services:

Programs to access advanced information services: There is nothing in the statute on advanced information services. Tennessee Education Network (TEN) has been implemented through a partnership with the Department of Education and the Board of Regents. It will be used to provide telecommunication training classes statewide. The Tennessee Information Infrastructure (TNII) is developing a statewide infrastructure for the public and private sector for delivery of social services, health care, library services, and community information.

Programs for electronic access to public/government records: Agencies are being encouraged to place their material on the state's WWW server. The first information of this type has been provided by the Department of Tourism in the form of the 1995 Tennessee travel guide.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Southwest Tennessee Development District Economic and Community Development. This grant will develop a video conferencing center for use by local governments, businesses, educational institutions and non-profit agencies throughout an eight-county area (Total $185K, Federal $92K).

University of Tennessee Center for Literacy Studies will address the problems of low educational achievement and unemployment by using information technology to create "one-stop shops" for adult education and training in a four-county area. TRIMS will link a wide variety of programs into a single system to serve adults with limited literacy skills (Total $457K, Federal $200K).

LeMoyne-Owen College Division of Research and Sponsored Programs. Residents of a public housing project will gain access to a wide variety of courses through the LeMoyne-Owen Distance Learning Community Center (Total $294K, Federal 165K).

TEXAS

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Financial Review Section
Texas Public Utility Commission
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Austin, Texas 78757
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STATE DEMOGRAPHICS

Population: 18,031,000
Size: 267,277
Proportion rural: 19.7%
Population per sq. mile: 68.8
Median household income: $28,282
Percent below poverty: 17.8%
Percent on public assistance: 6.3%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 9,372,622
Number of LECs: 58
BOC: Southwestern Bell
Market share of BOC: 77.7%
Penetration Rate: 91.5%
LEC competition permitted: 1995

OPASTCO STUDY

Subscribers per sq. mile: 2.4
Difference in non-BOC loop costs: 53.2%
Monthly revenues per customer: $15.55
Revenues if supports eliminated: $42.94
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.00%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 57.0%
Cable in schools: 52.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $8.15 - 11.05
LEC residential rates: $5.05 to $19.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost (High Cost Fund), Low income/economically disadvantaged (Tel-Assistance) , Users with disabilities (Dual party Relay Services)
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Independent 3rd party (TECA)
Contributors: LECs, BOC, IXCs
Basis of contribution: Access minutes of use
Types of subsidies: Tel-Assistance program: LECs are reimbursed lost revenues for each qualified resident (below poverty level) -- eligible residents receive a 65% reduction in rates; Dual Party Relay Service: LECs are reimbursed for hearing impaired customers; High Cost Fund: LECs with high cost who show cause
Who draws from fund: LECs who are eligible or have eligible subscribers
Is subsidy portable: Tel-Assistance and Dual Party Relay, Yes; High Cost Fund, No.

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** No **Link Up:** No **High Cost:** Yes

PENDING ACTIONS: The TPUC is currently revising the rules for the high cost (HC) program. The Tel-Assistance and Dual Party Relay service programs are going to stay the same. Changes in the High Cost program are taking place and will include who pays into fund and who gets subsidies. They will also have to flush out what a "telecommunication provider" means to determine who contributes to the HC fund. Contributions and distributions are made from each of the three funds. The TPUC has rate cases before it. There have been a number of filings related to new telephone services. One cable company has applied for certification. They expect to see a few rate increases.

COMMENTS: Texas is in a state of change in relation to how the USF will be used.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The General Services Commission has completed the design of a statewide video conferencing network in which agencies will be offered access to switched video services.

Programs to access advanced information services: The current docket requires LECs to make ISDN service available within all exchanges with more than 50,000 population by July 1996. Special access services are available when used in conjunction with telemedicine applications similar to a 25% discount currently available for educational applications. The TEX-AN network provides long distance calling, voice conferencing, and bandwidth (circuits) needed for data, facsimile and video conferencing of state government.

Programs for electronic access to public/government records: Texas has major initiatives in information and service delivery, Texas Information Highway (TIH) for public access to government agencies and Texas-ONE to offer low-cost access to high quality information and services targeted to small and medium size manufacturers. The TPUC has an Internet home page with agendas of pending meetings, notices of hearings, rules, legislative bills and news.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Texas A&M Research Foundation. This grant will demonstrate five different models for extending the information infrastructure into underserved, economically disadvantaged communities using both data and video conferencing services (Total $2,792K Federal $850K).

Corpus Christi Public Library Foundation will establish the Library Information Network for Corpus Christi (LINCC) to link public high school libraries through a shared computer network (Total $622K, Federal $180K).

University of Texas-Pan American Center for Entrepreneurship and Economic Development will develop and operate a NETmobile, which will travel to rural areas in south Texas to train and inform rural business owners, farmers, students, government officials, and residents about the Information Superhighway (Total $344K, Federal $172K).

County of El Paso Consolidated Data Processing will use their grant to construct a video-teleconferencing network that will provide video, audio and data conferencing capabilities to enhance the efficiency and effectiveness of these agencies in addressing crime-related issues in the three-state area (Total $843K, Federal $421K).

Region 19 Education Service Center Division of Technology Services. The Electronic Learning Network Alliance (ELENA) is an effort to implement distance learning in rural school districts. Families will be able to take advantage of courses and information on preventative health issues and social services (Total $470K, Federal $225K).

Holland Independent School District and other members of the Central Texas Collaborative will develop an advanced communications and information network linking the local school, library, and health center with university libraries, major hospitals and the Internet (Total $282K, Federal $130K).

Federation of State Medical Boards of the U.S. - Research and Development. This planning project will develop a model licensure process for the practice of interstate telemedicine and work with state medical boards to implement the model (Total $159K, Federal $75K).

UTAH

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Utah Public Service Commission
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Salt Lake City, Utah 84145
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STATE DEMOGRAPHICS

Population: 1,860,000
Size: 84,904
Proportion rural: 13.0%
Population per sq. mile: 22.6
Median household income: $34,433
Percent below poverty: 9.3%
Percent on public assistance: 3.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 830,417
Number of LECs: 14
BOC: US West
Market share of BOC: 95.9%
Penetration Rate: 96.6%
LEC competition permitted: 1995

OPASTCO STUDY

Subscribers per sq. mile: 0.6
Difference in non-BOC loop costs: 132.2%
Monthly revenues per customer: $12.60
Revenues if supports eliminated: $29.13
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 98.03%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 50.0%
Cable in schools: 66.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $3.50 - 7.98
LEC residential rates: $10.00 to $12.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Commission
Contributors: LECs, BOC, wireless, IXCs
Basis for contribution: 1/2 cent/minute NTS traffic
Types of subsidies: Direct infrastructure reimbursement, Cost of service subsidy
Who draws from fund: LECs (except US West) whose rates equal or exceed a target rate set by the UPSC
I s subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Utah continues to have a USF, but only on an interim basis. The objective is to replace it by September 1996 (Docket 93-999-05). The interim USF was an extension of what was in place since 1989. Defining basic service will be part of the revision. They want to do a much better job targeting of high cost areas and plan on breaking study areas into census groups so only those areas needing subsidy get it. They don't see changing who contributes but may lower the 1/2 cent charge since they have excess money in the USF. Distribution of money from the fund will be based on a Commission established "target rate" for local exchange service. They recently certified three new providers and just finished a US West rate case involving rate rebalancing case. US West wanted to raise residential rates by $5 per line. As a result of the rate case, US West was required to keep residential rates flat and lower business rates. LEC rates will go up in the short run, but new entrants will drive down rates. If rates are too low, then no competitors will enter the market. Wireless loop technology will become a factor in high cost areas in the future given Utah's geography.

COMMENTS: Utah's penetration rate is ahead of the national average. The Commission has been proactive and has tried to keep people on the phone system. UPSC policy prohibits disconnecting service because subscriber hasn't paid their long distance bill. They have also been proactive in extending service to non-covered areas using infrastructure reimbursements, and they have the Lifeline program for low income residents.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable providers have applied for certification, but they are watching process.

Programs to access advanced information services: Utah has proposed a Technology 2000 initiative to invest $120M in a state information highway. Technology 2000 will revolutionize education by training teachers and professors and developing technology-delivered courses on the largest wide area network of its kind in the world.
To promote telecommuting, 33 state employees will be provided with voice and data connections and equipment sufficient to perform their work from home from one to five days per week. Utah is also experimenting with satellite radio communication is remote areas to determine the feasibility of this new technology.

Programs for electronic access to public/government records: Utah has an Information Technology Commission that is setting up a state network. The state also has a Web Server/Bulletin Board to provide nationwide access to state government, and the establishment of news, list, gopher, and proxy server interfaces to the Internet is being pursued.

Public/private partnerships: The Technology 2000 initiative has significant private sector involvement and impact. Utah recently became the first state to establish digital signature rules to aid and encourage Electronic Commerce.

1995 NTIA/TIIAP GRANTS

Southern Utah University Department of Continuing Education is involved in a planning project to look at how information infrastructure can improve economic development, as well as K-12 education in the area. The plan calls for an emerging "Electronic Village" to provide introductions to the Internet, and will demonstrate examples of such villages through the WWW (Total $21K, Federal $11K).

Utah Department of Health Office of Strategic Planning and Evaluation will expand access to the Utah Public Health Information Network to the satellite public health offices that serve the 15 rural and frontier counties that make up the southern half of Utah (Total $514K, Federal $222K).

VERMONT

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Monttelier, Vermont 05620-2701
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STATE DEMOGRAPHICS

Population: 576,000
Size: 9,615
Proportion rural: 67.8%
Population per sq. mile: 62.2
Median household income: $32,829
Percent below poverty: 10.4%
Percent on public assistance: 7.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 327,517
Number of LECs: 9
BOC: NYNEX
Market share of BOC: 83.4%
Penetration Rate: 94.7%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile: 23.1
Difference in non-BOC loop costs: 2.1%
Monthly revenues per customer: $15.15
Revenues if supports eliminated: $28.68
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 14.27%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 58.0%
Cable in schools: 34.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.75
LEC residential rates: $6.00 to $16.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost, Low income/economically disadvantaged, Emergency services (911)
Definition of basic service: Touch tone, voice grade line, enhanced 911 services, directory assistance, modem capable, telecommunication relay service

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: LEC Assoc. (NECA)
Contributors: LECs, BOC, wireless, resellers
Basis for contribution: 2% surcharge on all bills including interstate, cellular, directory assistance, 2-way cable, and, PCN service
Types of subsidies: Rate subsidy, Direct infrastructure reimbursement
Who draws from fund: Telecommunication Relay Service: Subsidy given to provider of TRS service/contractor; Lifeline: Rate subsidy to the carrier for eligible customers; 911: Direct infrastructure reimbursement to carrier
Is subsidy portable: Lifeline: Yes, Others: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The VPSB is currently trying to decide how to distribute high cost funds. The legislation mandates US for high cost areas, and they are currently developing the formula for distributing high costs funds. They may try to expand the definition of basic service to include white page listing. They have a rate case with NYNEX who wants a 5% increase in residential rates. NYNEX also wants to go under a price cap. Rates are going up for local LECs, but LECs are required to expand services with rate increases. With deaveraging the statewide average rate will stay the same, but rural rates will go up. NYNEX was ordered to put in digital switches and the PSB disallowed the use of copper in the loop.

COMMENTS: NECA administers the Vermont USF.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: The Vermont Common Core initiative seek to utilize new digital and video technologies for use in assessment, instruction, remediation and enrichment activities.

Programs to access advanced information services: The state is expanding Internet to schools and people in rural areas can call schools to access the Internet.

Programs for electronic access to public/government records:

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Castleton State College. Through this grant representatives of the private sector, local government, and education will develop a telecommunication infrastructure plan for west-central Vermont (Total $116K, Federal $54K).

VIRGINIA

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Division of Communications
Virginia State Corporation Commission
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Richmond, Virginia 23209
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STATE DEMOGRAPHICS

Population: 6,491,000
Size: 42,326
Proportion rural: 70.6%
Population per sq. mile: 163.9
Median household income: $38,223
Percent below poverty: 9.4%
Percent on public assistance: 4.8%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 3,479,506
Number of LECs: 21
BOC: Bell Atlantic
Market share of BOC: 76.1%
Penetration Rate: 94.6%
LEC competition permitted: 1995

OPASTCO STUDY

Subscribers per sq. mile: 15.0
Difference in non-BOC loop costs: 28.7%
Monthly revenues per customer: $13.05
Revenues if supports eliminated: $25.94
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 99.74%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 62.0%
Cable in schools: 65.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $8.51 - $14.82
LEC residential rates: $6.00 to $16.35

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: None
Definition of basic service: None

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: VCC doesn't have a docket on US now, but they will after they issue rules on local competition. The draft rules require that they define basic service in the planned US docket. Target groups and funding mechanisms may also be part of that docket. Draft rules also say VCC can consider a USF, and requires participation of all telecommunication providers in any US program. GTE has filed a rate case requesting a substantial rate increase. They can't have new entrants until after the new rules are approved. Three companies under currently price cap for 3-5 years, so rates should be flat.

COMMENTS: The VCC is approaching US thoroughly and cautiously. VA has a high penetration rate, affordable rates, and the companies are making money. They're not sure a subsidy is needed and don't want to intervene if there is no problem.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: One cable company has been certified and will become a LEC on 1/1/96.

Programs to access advanced information services: The Virginia Information Technology Infrastructure Task Force is tasked to promote the establishment of a modern, state-of-the-art telecommunications and information technology network, fully utilized by state agencies and institutions, as well as local governments and the general public. Some smaller LECs are trying to support advanced information services by giving a flat rate for local call access to Internet. They are also trying to get more ISDN lines installed.

Programs for electronic access to public/government records: The Department of Information Technology has set up Virginia On-Line. The Commission plans on being on the Internet in the future.

Public/private partnerships: Some LECs have created special grants for education programs. Virginia wants to use more public/private partnerships in future to address its telecommunication needs.

1995 NTIA/TIIAP GRANTS

Blacksburg Electronic Village (BEV), Inc. This grant will bring high capacity Internet-based services into the daily activities of an underserved and disadvantaged, rural Appalachian population by replicating the model of the Blacksburg Electronic Village in Radford, VA. Government information, social services, public education, and local business information will be disseminated to homes, schools, public libraries, and places of work (Total $548K, Federal $267K).

Rockbridge Regional Library. This project is designed to bring citizens access to advanced communications and information services through computers located in public libraries. The libraries will be able to share information by computer links and members of the public can use the Internet and the world-wide information network (Total $606, Federal $225).

WASHINGTON

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STATE DEMOGRAPHICS

Population: 5,255,000
Size: 70,637
Proportion rural: 23.6%
Population per sq. mile: 78.9
Median household income: $34,064
Percent below poverty: 11.0%
Percent on public assistance: 6.9%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,946,010
Number of LECs: 26
BOC: US West
Market share of BOC: 65.6%
Penetration Rate: 95.7%
LEC competition permitted: 1994

OPASTCO STUDY

Subscribers per sq. mile: 11.6
Difference in non-BOC loop costs: 48.6%
Monthly revenues per customer: $13.10
Revenues if supports eliminated: $25.94
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 97.93 %
Other Technology: ISDN, BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 66.0%
Cable in schools: 74.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $8.75-12.75
LEC residential rates: $7.00 to $26.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund in place
Targeted Groups: Rural/high cost
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: LEC Association (WECA)
Contributors: LECs, BOC, IXCs
Basis for contribution: Carriers proportion of total state access minutes
Types of subsidies: Rate subsidy to eligible carriers
Who draws from fund: LECs whose unsupported loop cost is greater than 115% of the state-wide average
Is subsidy portable: Not at present

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Washington Independent Telephone Association has requested the WUTC define US and the WUTC is developing a position paper on how US should be funded on a competitively neutral basis. This will eventually lead to an order from the Commission. Some in the state have argued that the commission has no authority in this matter. As part of this position paper, they will define basic service, and modem capability is one issue. They are hoping to coordinate their efforts with current FCC initiatives. They don't regulate wireless, but they would include cellular and cable to the USF if they offer telephone service. The WUTC wants to make sure the distribution of funds, the subsidies, reflect the carrier's actual cost. US West currently has a rate case before the UTC, and GTE and United are making a series of draft filing in lieu of rate cases. US West has requested to increase residential rates to $26. The UTC is not sure rates should go up, even though carriers think so. They expect to see much more wireless used in the future, especially in remote areas.

COMMENTS: The WUTC is trying to be specific about what is being subsidized and how the subsidies will be used.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable companies have applied for certification, but they would participate in the USF if they provide local service.

Programs to access advanced information services: The Commission does not regulate information service providers. There are areas in the state that lack Internet providers, making access a problem in outlying areas. The Commission hopes it won't have to intervene and that competition will expand accessibility. A state Public Information Access Policy Task Force is currently seeking public comment on its draft report. A final report is due December 1, 1996.

Programs for electronic access to public/government records: Washington was the first commission to put documents on the Internet. The Governor has a. task force in place to examine this issue. What should be on line and how it should be paid for are unanswered questions.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

Alliance of Information and Referral Systems Contracts and Grants Division. This grant will establish standards for cataloging emergency resource information. It will also widen the array of information access paths available to disaster professionals, planning groups, and community residents by installing WWW sites to house and protect data structures from disruption (Total $592K, Federal $269K).

Community Technology Institute, located in Seattle, will create access to telecommunications for an additional 15,000 homeless and phoneless poor people by adding four cities - Miama, Phoenix, New Orleans, and Austin - to the national federation of Community Voice Mail programs (Total $183K, Federal $79K).

Northwest Regional Primary Care Association will develop a plan for a Regional Electronic Primary Care Network to serve the region. The project is designed to link primary care health care providers who serve medically underserved populations (Total $49K, Federal $24).

Urban League of Metropolitan Seattle. A team of high school sophomores will plan, design, and initiate a community information network and will, in turn, assist with training succeeding teams. Participants in the project will visit high technology firms in the Seattle area. Mentors from area high tech firms will be assigned to students for a "job shadowing" experience (Total $371K, Federal $181K).

WEST VIRGINIA

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STATE DEMOGRAPHICS

Population: 1,820,000
Size: 24,232
Proportion rural: 63.9%
Population per sq. mile: 75.6
Median household income: $20,301
Percent below poverty: 22.3%
Percent on public assistance: 9.7%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 815,728
Number of LECs: 9
BOC: Bell Atlantic
Market share of BOC: 83.5%
Penetration Rate: 90.5%
LEC competition permitted: no regulatory barrier

OPASTCO STUDY

Subscribers per sq. mile: 8.9
Difference in non-BOC loop costs: 26.7%
Monthly revenues per customer: $25.56
Revenues if supports eliminated: $49.37
Percent who would disconnect: 44.70%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** No
Percent local loop digital: 100%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 71.0%
Cable in schools: 64.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $15.80
LEC residential rates: $22.00 to $36.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: No statutes, regulations, or commission orders mandating Universal Service (US)
Targeted Groups: Low income/economically disadvantaged
Definition of basic service: None (see pending)

STATE UNIVERSAL SERVICE FUND: No

Fund Administrator:
Contributors:
Basis for contribution:
Types of subsidies:
Who draws from fund:
Is subsidy portable:

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: WV has not needed a USF in the past because US was embedded in the rate structure. But they are now considering a US program as part of a local competition docket (94-1102-T-GI). Currently, they have a task force looking at US. The task force has defined basic service to include a telephone number, white page listing, local call switching, access to 911, operator, directory assistance, telecommunication relay service, and access to a long distance carrier. They plan on staying focused on economically disadvantaged, but a high cost subsidy will be added with new legislation. In the new legislation all carriers will contribute to the USF including wireless. They are in the process of determining the subsidy level. The fund will be administered by an independent third party. Any subsidies will go to the carriers, not the customer. There are no pending rate cases and Bell's flat rate is going down to $15.00 on 1/1/96.

COMMENTS: WV's US program is just now being a formulated and will be quantified in the coming year. They are defining what US means under local competition. They expect the need for a USF is less of a problem in WV. They have statewide rates, and the rural nature of the state (i.e., not much business) means there may be less local competition than in other states.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Cable companies are participating in the task force on local service, but none have applied for certification.

Programs to access advanced information services: Some LECs have linked schools to the Internet, and eventually all schools should have access. West Virginia has been awarded a $2 million grant from IBM for a project aimed at harnessing the Internet for public education instruction. The Library Infomine provides for enhanced communication capabilities at 176 remote libraries around the state, including libraries in 55 public schools.

Programs for electronic access to public/government records:

Public/private partnerships: WV has a Tel-Assistance program that provides a tax credit to carriers for low income subscribers certified as eligible by the Health Department. The World School initiative provides high capacity information access capability to WV public education sites that fall within Bell Atlantic's service area.

1995 NTIA/TIIAP GRANTS

West Virginia Library Commission Cultural Center. This project will enable users in isolated, rural mountain communities to access information services available from electronic sources by merely visiting their local public libraries (Total $501K, Federal $225K).

West Virginia Community Action Directors Association. This planning grant will organize and educate community agencies in the use of the information infrastructure (Total $10K, Federal $5K).

WISCONSIN

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STATE DEMOGRAPHICS

Population: 5,038,000
Size: 80,371
Proportion rural: 34.3%
Population per sq. mile: 92.8
Median household income: $33,415
Percent below poverty: 10.8%
Percent on public assistance: 6.9%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 2,738,591
Number of LECs: 86
BOC: Ameritech
Market share of BOC: 66.3%
Penetration Rate: 97.0%
LEC competition permitted: yes

OPASTCO STUDY

Subscribers per sq. mile: 13.6
Difference in non-BOC loop costs: 41.4%
Monthly revenues per customer: $13.49
Revenues if supports eliminated: $17.45
Percent who would disconnect: 4.30%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 96.22%
Other Technology:

ADVANCED TELECOMMUNICATIONS

Cable households: 53.0%
Cable in schools: 71.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $5.40
LEC residential rates: $2.90 to $25.00

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with approved rules, fund not in place
Targeted Groups: Rural/high cost; Low income/economically disadvantaged; Users with disabilities; Schools, health care, and libraries (subsidy for advanced services); Homeless (free voice mail)
Definition of basic service: Single party, touch tone, emergency services, long distance access, fax grade line, modem capability (9600), telecommunication relay services, reasonably adequate calling area, white page listing, annual directory, operator and directory assistance, and toll blocking

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Independent 3rd party
Contributors: All providers of telecommunication services with over $200,000 in revenues
Basis for contribution: % of gross revenues
Types of subsidies: Rate subsidy, Direct infrastructure reimbursement, and Equipment reimbursement
Who draws from fund: Rate subsidy or voucher to customer - High rate assistance credit based on percent (2%) of median income in area; Low income based on individual eligibility; Users with disability get equipment voucher
Is subsidy portable: Yes for low income and users with disability

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: Wisconsin statute (S 196.218) mandated USF to start January 1996. The PSC has submitted rules to the legislation for approval. The new USF covers more programs than the past program. They have not set the % of gross revenues that will be used to determine contributions to USF, and have to hire an administrator. Other than this there are no pending changes. They do have to review the rules every 2 years. They have no cases pending. AMERITECH and GTE are under price regulation so their rates won't change much. They are seeing more and more fiber installed.

COMMENTS: WPSC is very close to implementing Wisconsin's new US program. They have a good program ready to go, but the legislature may not like the rules. They need to hire an administrator. The problem they may have is collecting money for the fund from resellers since some of them are located out of state.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: Some cable companies are providing point-to-point communication, and some have recently been approved to provide distance learning. The state is implementing its own statewide compressed videoconferencing and delivery network.

Programs to access advanced information services: The US program will provide advanced services to schools, libraries, homeless and health care organizations. Schools and library will receive 10-30% rate subsidies for advanced services from the USF. Homeless will have access to free voice mail. When Ameritech and GTE went under price regulation, they were required to install fiber to all secondary schools in Wisconsin. The Wisconsin Community Information Partnership (WiCIP) is developing a prototype for local community information networks that it hopes to deploy statewide.

Programs for electronic access to public/government records: There is currently a study underway to investigate this issue in the Department of Administration.

Public/private partnerships: Wisconsin Advanced Telecommunication Foundation supports the development of public/private partnerships. An Educational Technology Board is also being implemented to facilitate public/private partnerships. These are grant and/or loan programs.

1995 NTIA/TIIAP GRANTS

State of Wisconsin Department of Administration Bureau of Technology, Policy and Planning. The expansion of "Badger Dial" Internet access will provide cost-effective, universal Internet access for K-12 schools everywhere in Wisconsin providing an affordable base-line connection option to every school in the state (Total $742K, Federal $224K).

Milwaukee County Sheriff's Department is developing a method for delivering timely, accurate photographic information to the police officer on the street. The end result will be a telecommunications network capable of delivering high quality, photographic images to more than 3,500 officers (Total $83K, Federal $41K).

WYOMING

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STATE DEMOGRAPHICS

Population: 470,000
Size: 97,819
Proportion rural: 35.0%
Population per sq. mile: 4.8
Median household income: $30,379
Percent below poverty: 10.3%
Percent on public assistance: 5.2%

TELEPHONE SERVICE DEMOGRAPHICS

Number of lines: 249,188
Number of LECs: 14
BOC: US West
Market share of BOC: 83.0%
Penetration Rate: 92.6%
LEC competition permitted: 1995

OPASTCO STUDY

Subscribers per sq. mile: 0.2
Difference in non-BOC loop costs: 35.5%
Monthly revenues per customer: $16.05
Revenues if supports eliminated: $35.26
Percent who would disconnect: 27.10%

TELEPHONE SERVICE TECHNOLOGY

Copper : Yes **Hybrid Fiber:** No
Fiber : Yes **Microwave:** Yes
Percent local loop digital: 67.96%
Other Technology: Fixed cellular, BETRS

ADVANCED TELECOMMUNICATIONS

Cable households: 72.0%
Cable in schools: 63.0%

TELEPHONE SERVICE RATES

BOC residential rate (s): $12.64 - $14.64
LEC residential rates: $5.75 to $16.80

UNIVERSAL TELEPHONE SERVICE PROGRAMS

Status of State Universal Service Program: Mandated Universal Service (US) with proposed rules, fund not in place (Final adoption of rules is anticipated in early December, 1995)
Targeted Groups: Rural/high rate
Definition of basic service: Single party, voice grade, 911, long distance, residential or business flat or measured

STATE UNIVERSAL SERVICE FUND: Yes

Fund Administrator: Commission
Contributors: LECs, BOC, IXCs, wireless
Basis for contribution: % of gross retail revenues
Types of subsidies: Rate subsidy to carriers with credit listed on customer bill
Who draws from fund: LECs with rate above 130% of weighted statewide average
Is subsidy portable: No

FEDERAL UNIVERSAL SERVICE FUNDS: **Lifeline:** Yes **Link Up:** Yes **High Cost:** Yes

PENDING ACTIONS: The PSC is nearly finished with the rule making process for US. The Governor will sign the rules within 60 days of final adoption, and they will begin implementing the program. If no one draws from the fund, the commission can suspend it. US West has filed a price regulation plan that includes some substantial rate increases. There is also some discussion about upgrading the infrastructure.

COMMENTS: The WPSC has a heightened awareness of US in light of recent transitions in local competition. Deregulation makes US more important, and the key to US is implementation of a funding mechanism that insures availability and affordability.

ADVANCED TELECOMMUNICATION SERVICES

Programs to access video/cable services: No cable companies have applied for certification.

Programs to access advanced information services:

Programs for electronic access to public/government records: Ferret is a state sponsored bulletin board that allows public access to government records. The Commission is in process of setting up its own bulletin board.

Public/private partnerships:

1995 NTIA/TIIAP GRANTS

None.