

Commissioner Primer

Universal Service

The National Regulatory Research Institute

May 2006

Edwin Rosenberg, Ph.D.
Senior Institute Economist

Lilia Pérez-Chavolla, Ph.D.
Research Associate

Jing Liu, M.A.
Graduate Research
Associate

EXECUTIVE SUMMARY

This primer presents an introduction to universal service in telecommunications, a large and challenging policy issue. This primer addresses the definitions, goals, statutory basis, and rationales for universal service policies, discusses the development of universal service policy, universal service outcomes, linkages between universal service policy and other issues, and describes current issues surrounding universal service, including some proposals for reform of universal service policy. A companion survey on state universal service funding mechanisms will be forthcoming.

Universal service affects all telecommunications users and providers and represents billions of dollars – total federal support for 2006 is estimated to be \$7.3 billion. The goal of universal telephone service is to make acceptable quality telecommunications services available at affordable rates to as many individuals as is practical. Universal service policies have evolved to provide support for services in high-cost areas as well as service to low-income consumers, schools and libraries, rural health care facilities, and consumers with special needs, such as those who are speech and/or hearing impaired.

Though the Telecommunications Act of 1996's main focus was on competition, it gave an explicit mandate to state and federal governments to preserve and advance universal service. Coverage was extended to advanced services for schools and libraries and for rural health care facilities, and support shifted from implicit mechanisms, such as rate averaging and subsidies from toll access charges, to explicit mechanisms, such as universal service funds supported by surcharges on telecommunications revenues. Overall, results are encouraging – nationally, 94 percent of all households and 88 percent of low-income households have a telephone. However, factors including falling interstate revenues and the growth of voice over internet protocol (VoIP) service have put pressure on the Federal Communications Commission and the states to consider other options, possibly a line or number charge, to ensure sustainability of the program. In addition, various legislative proposals might affect universal service funding.

Contents		Total Federal Universal Service Support	
Introduction	2	USF Collection and Disbursement Patterns	18
Universal Service Mandates	2	Universal Service Results	20
Rationales for Universal Service Policies	4	State Universal Service Programs	26
Services Supported Under Universal Service	6	Universal Service Issues	28
Universal Service Support Prior to the 1996 Act	6	Proposals for Universal Service Reform	31
Current Universal Service Programs	7	Conclusion	33

The authors thank Commissioner Larry Landis of the Indiana Utilities Regulatory Commission, John Ridgway of the Iowa Utilities Board, and NRRI's Interim Director, Dr. Vivian Witkind Davis, for useful comments on earlier drafts of this primer. We also thank NRRI's Report Production Editor, Carmell Brown, for preparing the final draft.

INTRODUCTION

Simply put, in the current U.S. context, “universal telephone service” means that acceptable quality telecommunications services are available at affordable rates to as many individuals as is practical. Universal service policy aims to achieve universal telephone service. Both the concept of universal service and universal service policy have undergone considerable change over time.¹

This primer introduces the definitions, goals, statutory basis, and rationales for universal service.

This primer addresses the definitions, goals, statutory basis, and rationales for universal service policies in telecommunications. It also briefly discusses the historical development of universal service policy, universal service outcomes, the linkages between universal service policy and other issues, and describes current issues surrounding universal service.

UNIVERSAL SERVICE MANDATES

Communications Act of 1934

The Communications Act of 1934 (Communications Act, 1934 Act) created the Federal Communications Commission (FCC) with a purpose of:

Regulating interstate and foreign commerce in communication by wire and radio so as to make available, so far as possible, to all the people of the United States, without discrimination on the basis of race, color, religion, national origin, or sex, a rapid, efficient, nationwide, and worldwide

wire and radio communication service with adequate facilities at reasonable charges ...²

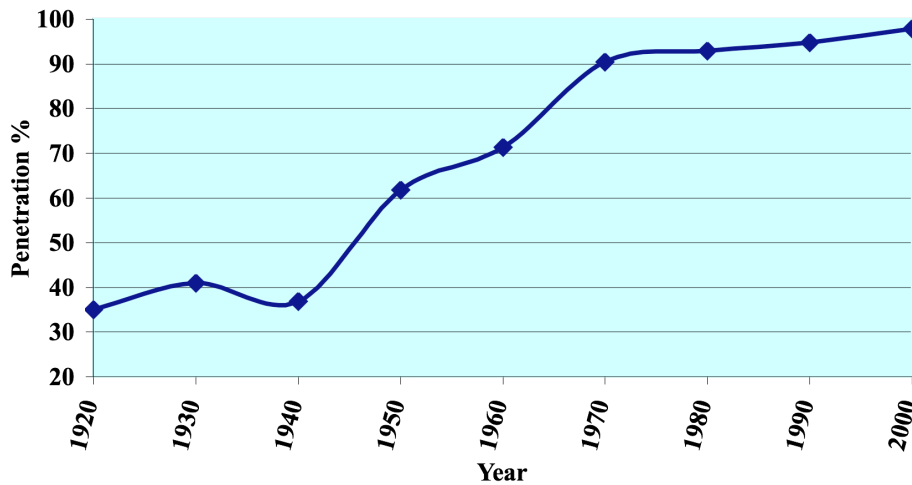
Embedded in this statement are concepts that might be interpreted as promoting universal service. However, fewer than 40 percent of households had a phone in 1934. Thus, to the extent that the concept or goal of universal service was embodied in the 1934 Act, it should be viewed as inspirational or aspirational, and it is not evident that any form of large-scale, operational, universal service policy existed for many years. In fact, as illustrated in Figure 1, the proportion of American households with a telephone likely did not exceed 50 percent until after World War II.³

Telecommunications Act of 1996

The stated goals of the Telecommunications Act of 1996 (Telecommunications Act, the 1996 Act) were:

To promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.⁴

Though competition was the main focus of the 1996 Act, a universal service mandate was explicitly codified for the first time. Indeed, the 1996 Act lists goals or principles for policies for the preservation and advancement of universal service:



Source: FCC, *Trends in Telephone Service*, April 2005. Table 16.4.

Fig. 1. Household telephone penetration 1920-2000.

- Quality services should be available at just, reasonable, and affordable rates
- Access to advanced telecommunications and information services should be provided in all regions of the nation
- Consumers in all regions of the nation, including low-income consumers and those in rural, insular, and high-cost areas, should have access to telecommunications and information services, including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at rates that are reasonably comparable to rates charged for similar services in urban areas
- Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services
- Every telecommunications carrier that provides interstate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, to the specific, predictable, and sufficient mechanisms established by the FCC to preserve and advance universal service⁵
- All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service
- There should be specific, predictable, and sufficient federal and state mechanisms to preserve and advance universal service⁶

A federal universal mandate was codified for the first time on the Telecommunications Act of 1996.

Universal service is expected to evolve as telecommunications technologies do.

A federal-state joint board reviews universal service periodically.

Especially noteworthy in the 1996 Act are the extension of the concept of universal service to cover schools, libraries, and health care providers and the further extension from voice services to services which had not previously been covered, i.e., advanced telecommunications and information services for schools, libraries, and rural health care providers.

Moreover, the 1996 Act recognized the evolving nature of telecommunications technology, noted that universal service is a concept applied to an evolving level of telecommunications services, and directed the FCC to review universal service periodically, taking into account advances in telecommunications and information technologies and services. The 1996 Act directed the establishment of a Federal-State Joint Board on Universal Service (Joint Board).⁷ Specifically, in determining or modifying the set of services supported by federal universal service support mechanisms, the Joint Board and the FCC were to consider the extent to which such services:

- Are essential to education, public health, or public safety
- Have, through the operation of market choices by customers, been subscribed to by a substantial majority of residential customers
- Are being deployed in public telecommunications networks by telecommunications carriers
- Are consistent with the public interest, convenience, and necessity⁸

State Authority Under the 1996 Act

Though the FCC was given a national mandate to preserve and advance universal service, state authority to adopt universal service rules and definitions was preserved. Specifically, states may adopt additional specific, predictable, and sufficient mechanisms to preserve and advance universal service within that state, so long as they do not rely on or burden federal universal service support mechanisms.⁹ Moreover, if a state establishes its own universal service support mechanism, the 1996 Act requires every telecommunications carrier providing intrastate telecommunications services to contribute, on an equitable and nondiscriminatory basis, in a manner the state determines necessary for the preservation and advancement of universal service.¹⁰

RATIONALES FOR UNIVERSAL SERVICE POLICIES

Universal service policies may be based on several rationales, including network externalities, public interest or equity, and economic infrastructure and development arguments.

Network Externalities

The network externality rationale for subsidizing universal service is that in an interconnected network industry the value of the network to each user depends on how many other users can be reached via the network. Thus, the network becomes more valuable as additional subscribers are added. However, in deciding whether to

become a subscriber, an individual compares his or her own private benefit from subscribing and does not internalize or consider the benefit his or her connection to the network gives others. As a result, some individuals would choose not to subscribe, even though the total (private and public) benefits of their subscription exceed the price of subscription. Under this rationale, universal service subsidies should be provided to individuals who would not otherwise subscribe. This rationale applies both to low-income individuals and to a somewhat broader group in high-cost areas, but it does so only to the extent that these individuals would not otherwise subscribe to the network.¹¹

Public Interest and Equity

The public interest or equity rationale for subsidizing universal service is to ensure a ubiquitous network that is accessible to as many people as possible. This rationale is based on the notion that public health and safety interests require citizens to be able to reach emergency services (law enforcement, fire, and medical) quickly and easily. Moreover, in order for citizens to be fully functioning in a modern society, they need to be able to reach political and educational institutions.¹² Under this rationale, areas that would generally be uneconomic to serve are subsidized to ensure that these areas and the individuals therein have access to the telephone network. Equity claims might be used to support policies to subsidize access by low-income individuals to avoid partitioning people into telecommunications “haves” and

“have-nots.” There is a noticeable gap in telephone subscribership across different income groups, and universal service policies play a redistributive role, especially in enabling low-income households and households living in high-cost areas to have affordable rates for telecommunications services. This rationale might also underlie support for subsidizing provision of advanced services to schools, libraries, and rural health care facilities, and it might be used to justify public interest payphones and “soft” or “warm” dial tone, which allows households whose telephone service has been terminated to reach the 911 operator.

Economic Infrastructure and Development

This rationale rests on the recognition of communications as a lifeblood of modern commerce and the communications network as part of the basic economic infrastructure that is a precursor for growth and development. An area or region without a modern, fully capable communications network might not be able to participate in modern, information-based economic activity. As was the case with the railroads in the nineteenth century and the interstate highway system in the mid-twentieth century, no community, state, and region wants to be without a fully capable communications network.

Rationales for universal service:

- *The more users, the more valuable the network*
- *The public interest is served by making sure telephone service is available to everyone*
- *Modern telecommunications are essential to economic development*

SERVICES SUPPORTED UNDER UNIVERSAL SERVICE

Supported Services

In the case of schools, libraries, and rural health care facilities, universal service support may include all commercially available telecommunications services. For residential and business customers, the FCC lists the following functions or services as eligible for universal service support:¹³

- Voice grade access to the public switched network, with the ability to place and receive calls
- Local usage
- Dual Tone Multifrequency signaling [Touchtone®, for example] or its functional equivalent
- Single-party service
- Access to emergency services, including in some instances, access to 911 and enhanced 911 services
- Access to operator services
- Access to interexchange services
- Access to directory assistance
- Toll limitation services for qualifying low-income consumers

Eligible Telecommunications Carriers

Only carriers that have been designated as Eligible Telecommunications Carriers (ETCs) are eligible to receive federal universal service support. To be designated as an ETC, a carrier must offer the set of services listed above and advertise their availability in the service area in which it is an ETC.¹⁴ Though most ETCs are incumbent local exchange carriers (ILECs), com-

petitive ETCs (CETCs) may receive universal service support to the extent that they have been certified to do so. To do this, they must provide services using their own facilities or leased facilities. Pure resellers cannot be ETCs. CETCs receive support based on the number of lines they serve and the costs of the ILEC that serves that area. CETCs receive the same per-line support in an area as would the relevant ILEC.¹⁵

UNIVERSAL SERVICE SUPPORT PRIOR TO THE 1996 ACT

In the regulated monopoly era that existed prior to passage of the 1996 Act, a number of mechanisms were used to support the goal of universal service.¹⁶ These mechanisms tended to move subsidies from urban to rural subscribers, from business to residential subscribers, from long-distance to local service, from wealthier subscribers to low-income subscribers, and from non-basic to basic services.¹⁷ These included implicit mechanisms and explicit mechanisms.¹⁸

Implicit Mechanisms:

- *Rate averaging*, which averaged costs over wide geographic areas that often had considerable cost variation
- *Value-of-service pricing*, which based retail prices on the assumed value of the service to subscribers rather than on the cost of service¹⁹

Universal service is aimed at local voice service, with a few basic add-ons.

Only designated carriers are eligible for universal service support.

- *Non-cost-based rate differentials*, which resulted in the spread between the price of basic local service for business and residential customers
- *Access charge subsidies*, which kept long-distance originating and terminating access charges well above cost to keep local rates low
- *Residual pricing*, which allowed the prices of optional or enhanced services (caller I.D., voice mail, and call waiting, for example) to be set well above cost, reducing the revenue requirement from basic service

Explicit Mechanisms:

- *High-cost funds*, which provide direct support on a per-line basis where costs of telephone service are higher
- *Lifeline and Link-Up*, which provide targeted support to identified customers who meet some form of means test
- *Separations rules*, which allow smaller companies to put relatively more of their customer loop plant²⁰ and switching costs into the interstate jurisdiction

CURRENT UNIVERSAL SERVICE PROGRAMS

The mandate of the 1996 Act to open telecommunications markets to competition has resulted in considerable elimination of the implicit mechanisms, since they either were unsustainable in a competitive environment or created barriers to competitive entry. In their place, explicit, competitively neutral mecha-

nisms, such as high-cost support and Lifeline and Link-Up support have grown, and new mechanisms to support schools and libraries and rural health care have been created. There are four major universal service support programs: High-Cost Support; Low-Income Support; Rural Health Care Support; and Schools and Libraries Support.²¹

Collection and Administration of Federal Universal Service Funds

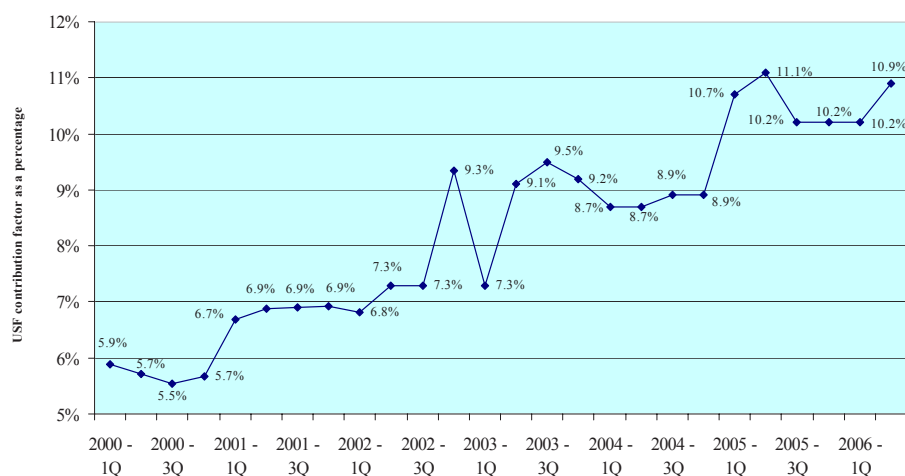
All federal universal service support mechanisms are administered by the Universal Service Administrative Company (USAC), which was created by the FCC for that purpose. Federal universal service support comes from surcharges on billed interstate and international revenues.²² Providers contributing to the pool for the universal service fund (USF) include fixed local service, payphone, wireless, and toll service providers. USAC files reports with the FCC prior to the start of each quarter. These reports include projections of the amounts to be paid for each program over the coming quarter, revenues subject to the universal service surcharge, and any adjustments necessary to true-up actual and projected disbursements (including USAC's administrative expenses). Based on USAC's projections, a contribution factor to be applied to interstate and international revenues is established for the coming quarter.

The Increasing USF Contribution Factor

Figure 2 shows the time path of the federal USF contribution factor from

The 1996 Act led to elimination of implicit universal service mechanisms, which are unsuited to a competitive market.

Support mechanisms are administered by the Universal Service Administrative Company.



Source: Authors' construct from USAC data and FCC filings.

Fig. 2. Federal USF contribution factor on interstate and international revenues 2000-Q1 to 2006-Q2.

2000 through the beginning of 2006. Although the contribution factor began this period at a level below 6 percent, as shown in Figure 2, it has generally risen over time and has been above 10 percent since the beginning of 2005. For the second quarter of 2006 the contribution factor is 10.9 percent.²³

The universal service fund contribution factor has been rising.

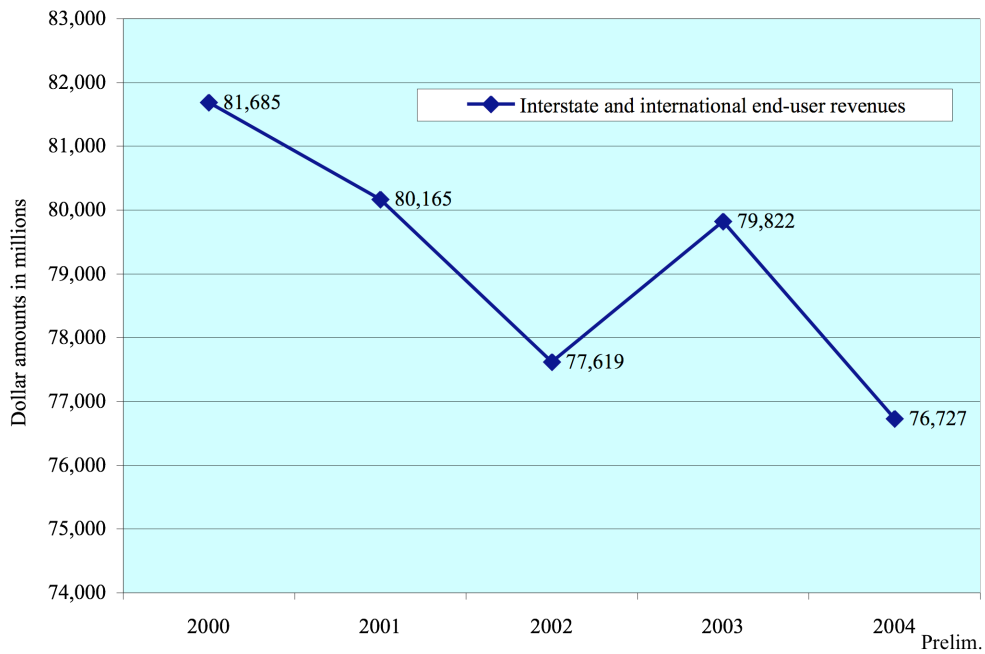
Falling Interstate and International Revenues

The generally rising trend of the USF contribution factor shown in Figure 2 results from a combination of rising demand for universal service support and, as shown in Figure 3, a downward trend in the sum of interstate and international revenues, the base upon which the contribution factor is assessed.

Shifts in the Shares of USF Contributions by Provider Type and Industry Segment

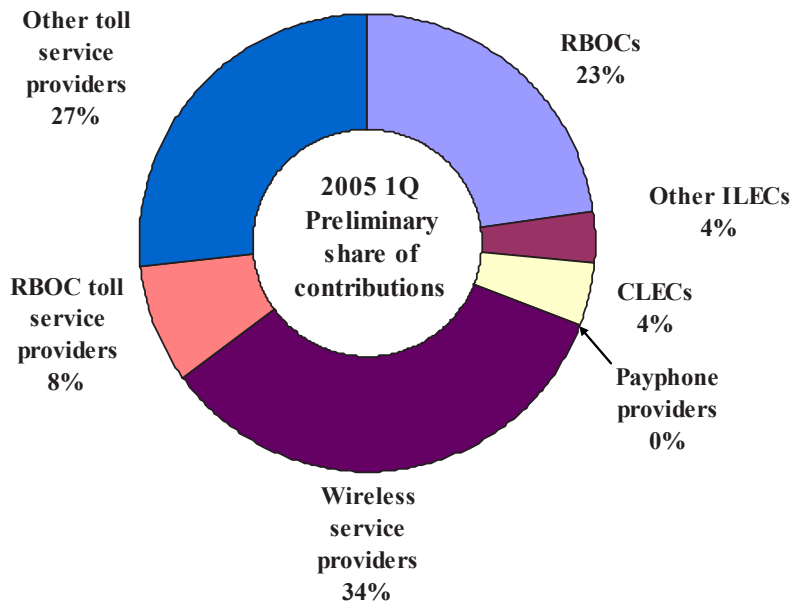
All telecommunications firms with interstate or international revenues are required to contribute to the federal USF. The distribution of federal USF contributions by provider type as of early 2005 is shown in Figure 4. Wireless providers contributed the largest share (34 percent), with Regional Bell Operating Companies (RBOCs) (31 percent) and other toll providers (27 percent) accounting for the second and third largest shares, respectively. These three sources accounted for 92 percent of total contributions.

Figure 4 illustrates the recent share of federal USF contributions by type of provider. However, shares of federal USF contributions by provider type



Source: FCC, *Telecommunications Industry Revenues 2003*, March 2005, Table 1. Summarized from FCC Form 499-A Telecommunications Reporting Worksheets.

Fig. 3. Interstate and international revenues.



Source: FCC, *Telecommunications Industry Revenues 2003*, March 2005, Table 12.

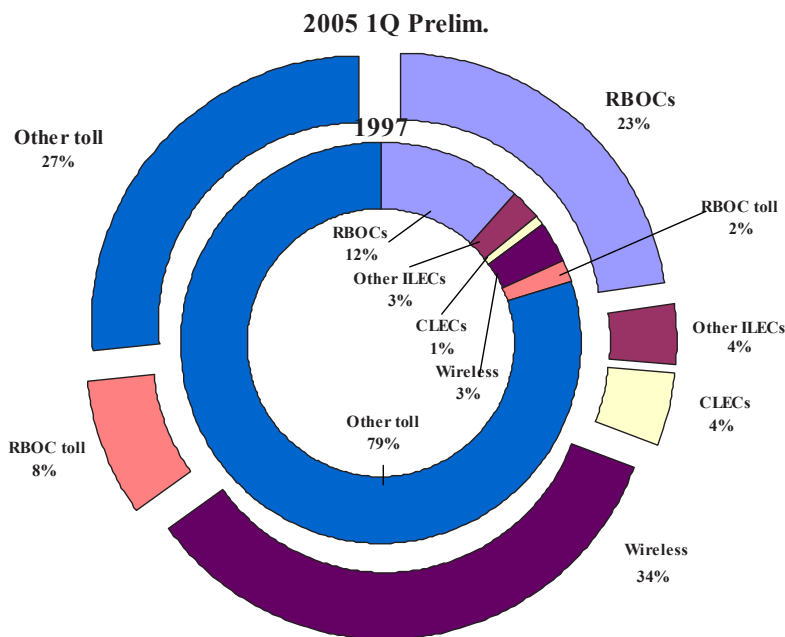
Fig. 4. Source of federal USF contributions.

Wireless providers are today the largest source of universal service contributions, followed by Regional Bell Operating Companies and other toll service providers.

have changed considerably over time. As shown in Figure 5, in 1997, nearly 80 percent of contributions came from other toll providers; the RBOCs and wireless providers contributed only 17 percent (including RBOC toll). However, by early 2005, the RBOCs and wireless contributed 57 percent (including RBOC toll), while other toll providers contributed only 27 percent. This shift in contribution shares by provider type between 1997 and early 2005 is illustrated in Figure 5, which contrasts contribution shares in these two periods.

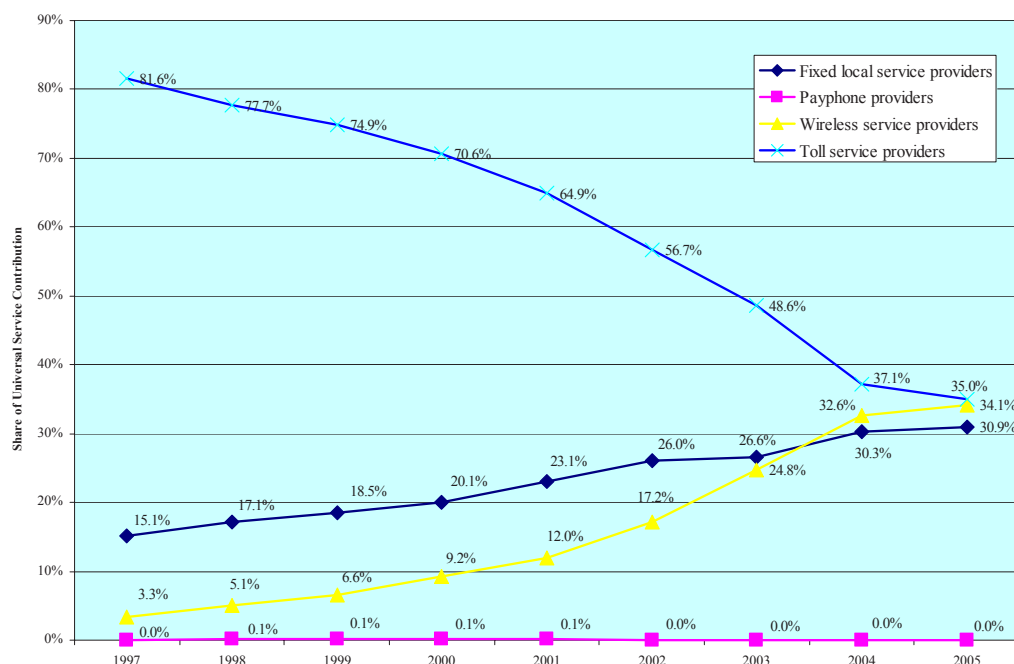
The relative shares of federal USF contributions by industry segment have also shifted considerably. These time trends are shown in Figure 6, which plots the relative shares of federal USF contributions from various

industry segments over time. In 1997, toll providers paid over 80 percent of total contributions, while local and wireless providers combined paid less than 20 percent. By 2005, the shares of these three provider groups had nearly converged, with each group accounting for at least 30 percent of total contributions. During this period, the local share doubled from 15 percent to 30 percent. Numerically, the most dramatic change was the decrease in the toll share by more than half, from over 80 percent to 35 percent. In a relative sense, however, the increase in the wireless share from 3 percent to 34 percent was even more dramatic. These shifts reflect the decline in toll revenues, growth in local revenues, and an explosion in wireless revenues.²⁴



Source: FCC, *Telecommunications Industry Revenues 2003*, March 2005, Table 12.

Fig. 5. Evolution of federal USF contribution shares 1997-2005.



Source: FCC, *Telecommunications Industry Revenues 2003*, March 2005, Table 12.

Fig. 6. Shares of federal USF contributions by industry segment 1997-2005.

High-Cost Support²⁵

High-cost support provides subsidies to carriers serving areas with per-line costs significantly above the national average cost per line. In those areas, basing end-user retail prices strictly on the cost of service would likely create a barrier to subscription and frustrate the achievement of universal service goals.²⁶ Moreover, purely cost-based rates would not be consistent with the mandate in the 1996 Act that services be “available at rates that are reasonably comparable to rates charged for similar services in urban areas.”²⁷

A variety of individual mechanisms are included in the overall high-cost support program: embedded high-cost loop support (HCLS); forward-looking non-rural high-cost model support (HCMS); interstate access

support (IAS) for price-cap carriers; interstate common line support (ICLS) for rate-of-return carriers;²⁸ local switching support (LSS); safety net additive support (SNA); and safety valve support (SVS).

Loop Support: HCLS and HCMS

Much of the cost differential between areas may be attributed to differences in the average length of the telephone loop connecting homes and businesses to the central office or local switch. In sparsely populated rural areas, average loop length tends to be much longer than in more densely populated urban or suburban areas. Thus, the cost of the subscriber plant necessary to connect an average customer will be greater. Both HCLS and HCMS are designed to subsidize high-cost areas. HCLS applies to areas served by rural

High-cost support subsidizes carriers in areas with per-line costs significantly above the national average.

The high-cost support program has several individual mechanisms.

Non-rural incumbents receive support based on a forward-looking cost model.

Support is targeted to individual wire centers with forward-looking costs higher than a benchmark.

ILECs; HCMS applies to areas served by non-rural ILECs.

HCLS: ILECs use the jurisdictional separations process to divide their non-traffic-sensitive (NTS) costs²⁹ between intrastate and interstate jurisdictions. The general rule is that 25 percent of NTS costs are allocated to the interstate jurisdiction. If a rural ILEC's embedded (historic accounting) NTS costs are greater than 115 percent of the national average, it may allocate an additional portion of its NTS costs to the interstate jurisdiction and have those costs recovered by HCLS, with the amount recoverable via HCLS increasing as NTS costs are larger relative to the national average.

HCMS: Non-rural ILECs receive support based on the FCC's forward-looking, engineering/economic cost model that estimates the cost of building a telephone network capable of delivering the universal service package in an area. For each state, the cost model calculates the forward-looking cost per line incurred by non-rural carriers to provide supported services at the wire-center level. The HCMS provides support to non-rural carriers in states with statewide average forward-looking cost per line greater than the national benchmark, which is now two standard deviations above the national average.

Support is targeted to individual wire centers that have forward-looking costs in excess of the benchmark; the amount of support given a carrier that serves an eligible wire center is based on relative costs in that wire center

and the number of lines served by the carrier.

Access Support: IAS and ICLS

The IAS and ICLS mechanisms resulted from the FCC's reform of interstate access charges in the CALLS and MAG proceedings.³⁰ As those charges were forced toward cost, the federal subscriber line charge (SLC) was increased to make up part of the revenues lost as a result. To the extent that those revenues were not replaced, the IAS and ICLS mechanisms were designed to make up the difference for large and small ILECs, respectively.³¹

IAS: In 2000, the FCC lowered interstate access charges for large ILECs and established an explicit interstate access support mechanism to replace the implicit support previously collected through interstate access charges. The IAS mechanism provides support to carriers serving lines in areas where they are unable to recover their permitted revenues from the subscriber line charges. Support is per-line, portable, and available on a competitively neutral basis to any ETC serving a supported customer, regardless of the technology used.

ICLS: In 2001, the FCC lowered interstate access charges for small ILECs and created the ICLS mechanism to convert implicit support in the access rate structure to explicit, portable universal service support. ICLS recovers any shortfall between the allowed common line revenues of rate-of-return carriers and their subscriber line charge revenues and

gradually replaces the carrier common line charge.

Switching Support: LSS

LSS provides support to ILECs with study areas of 50,000 or fewer access lines to help defray the higher switching costs of small ILECs. The LSS is recovered through the universal service support mechanisms, rather than through higher traffic-sensitive access charges.

Special Support Mechanisms for Rural Areas: SNA and SVS

High-cost loop support in non-rural areas is based on the FCC's cost proxy model. This model was developed to impose forward-looking least-cost discipline on providers. However, the model did not perform well when applied to the rural carriers, typically underestimating the cost of service. Because of this problem, support for rural carriers continues to be based on their embedded costs. The Joint Board has been considering the issue, and the FCC has worked to improve the cost proxy model. However, legitimate concerns might be raised regarding the incentive effects of basing support for rural carriers on their individual embedded costs, especially to the extent that a carrier's support rises with costs.

In July 2001, the FCC implemented modified high-cost support mechanisms to provide additional support to rural carriers. These mechanisms were scheduled to exist for at least five years to allow the Joint Board to consider permanent mechanisms for rural

carriers.³² In the interim, high-cost support for rural carriers is subject to a cap that grows by the rate of growth of rural loops plus the rate of inflation measured by the Gross Domestic Product – Chained Price Index. In addition, there are mechanisms that address special situations.

SNA is a sub-component of HCLS. It provides “above the cap” support for carriers making significant investment in rural infrastructure in years when HCLS is capped. SNA is intended to provide carriers with additional incentives to invest in their networks. It is available to rural ETCs whose per-loop telephone plant in service increases by more than 14 percent in one year.³³

SVS is also a sub-component of HCLS. It provides “above the cap” support to rural ETCs and is aimed at rural carriers that acquire high-cost exchanges and make substantial investments to enhance network infrastructure. SVS support equals 50 percent of the difference between the pre-acquisition index year HCLS and HCLS in subsequent years. In addition, SVS is, itself, capped at 5 percent of the rural HCLS in any given year, and a rural ETC's acquired exchanges cannot receive more through the capped HCLS and SVS than they would under uncapped HCLS.³⁴

High-Cost Support Summary

High-cost funding has expanded in size and scope since passage of the 1996 Act. Though these mechanisms look confusing, each addresses a particular set of circumstances leading

Support for rural carriers continues to be based on their embedded costs, although the incentive effects of this method are of concern.

Each of the high-cost mechanisms described here addresses a particular set of circumstances that leads to high costs.

Low-income support programs provide discounts on monthly telephone service and installation to qualifying customers.

“Lifeline” support for monthly bills averaged \$11.22 per line in 2004.

to high costs. The relative sizes and the growth of the various high-cost support mechanisms are shown in Table 1.

Table 2 shows how total high-cost support has been split between ILECs and entrants (CETCs). Though CETCs receive only about one-sixth of total support, their share has been growing.

Low-Income Support: Lifeline and Link-Up³⁵

The low-income support programs provide means-tested discounts on monthly telephone service (Lifeline) and telephone installation (Link-Up America) to qualifying consumers. Carriers offering Lifeline and Link-Up are required to publicize the availability of those programs using media of general distribution.

Lifeline and Link-Up Eligibility

In states that provide state Lifeline support, Lifeline and Link-Up are available to all subscribers who meet state eligibility requirements. States have some latitude in selecting means tests, provided that eligibility for Lifeline and Link-Up is based solely on income or factors directly related to income. In states that do not provide Lifeline support, the default eligibility requirement is consumer certification of household income no greater than 135 percent of the Federal Poverty Guidelines or participation in at least one of seven federal assistance programs.³⁶

Lifeline Support Levels

There are four tiers of federal Lifeline support:

- Tier 1 support, which is available to all eligible subscribers, provides a discount equal to the applicable federal SLC
- Tier 2 support, which requires state approval,³⁷ provides an additional \$1.75 per month in federal support
- Tier 3 support requires the state or carrier to provide additional non-federal support. It matches half of non-federal support up to a maximum of \$1.75 in additional federal support, provided that the carrier discounts the subscriber's bill by the full amount of total support³⁸
- Tier 4 support, available only to eligible subscribers living on tribal lands, provides up to an additional \$25 per month towards reducing basic local service rates, provided that, after the discount, subscribers eligible for Tier 4 support must pay at least \$1 a month for local phone service

In 2004, total state and federal Lifeline support averaged \$11.22 per line per month with considerable variation (from a minimum of \$3.50 to a maximum of \$18.45). Basic federal support ranged from a minimum of \$3.50 to a maximum of \$8.25.³⁹ State support averaged \$2.67, with a minimum of \$0.00 and a maximum of \$8.45.⁴⁰

TABLE 1
FEDERAL HIGH-COST SUPPORT FUND PAYMENT HISTORY
(IN MILLIONS OF \$)

Year	High-Cost Loop Support	Safety Net Additive Support	Safety Valve Support	High-Cost Model Support	Long-Term Support ^a	Interstate Common Line Support	Interstate Access Support	Local Switching Support	Total High-Cost Support
1986	\$56	-	-	-	-	-	-	-	\$ 56
1987	126	-	-	-	-	-	-	-	126
1988	183	-	-	-	-	-	-	-	183
1989	265	-	-	-	\$236	-	-	-	500
1990	339	-	-	-	263	-	-	-	602
1991	485	-	-	-	272	-	-	-	757
1992	609	-	-	-	306	-	-	-	915
1993	705	-	-	-	323	-	-	-	1,028
1994	725	-	-	-	347	-	-	-	1,072
1995	750	-	-	-	382	-	-	-	1,132
1996	763	-	-	-	426	-	-	-	1,188
1997	794	-	-	-	470	-	-	-	1,263
1998	827	-	-	-	473	-	-	\$390	1,690
1999	864	-	-	-	473	-	-	380	1,718
2000	874	-	-	\$219	478	-	\$279	385	2,235
2001	927	-	-	206	492	-	577	390	2,592
2002	1,045	-	-	233	493	\$ 173	615	376	2,935
2003	1,085	\$ 9	\$0	234	504	409	622	396	3,259
2004	1,137	12	0	273	275	727	642	422	3,488
2005*	1,238	#	#	292	-	1,178	691	425	3,824

Source: FCC, 2005 Monitoring Report, Table 3.1.

Notes: * 2005 data taken from USAC, 2005 Annual Report, p. 39.; - mechanism did not exist in that year; # for 2005, the reported figure for High-Cost Loop Support includes disbursements for Safety Net Additive Support and Safety Valve Support.

^a Long-term Support (LTS) was combined with ICLS in July 2004.

TABLE 2
DISTRIBUTION OF HIGH-COST SUPPORT
BETWEEN ILECs AND CETCs 1998-2005Q4
(IN MILLIONS OF \$)

YEAR	Distributed to ILECs	Distributed to CETCs	TOTAL Distribution	CETC Percentage
1998	\$1,696.6	\$ 0.0	\$1,696.6	0.00
1999	1,723.1	0.5	1,723.7	0.03
2000	2,515.3	1.5	2,516.8	0.06
2001	2,583.2	20.2	2,603.4	0.78
2002	2,934.5	47.5	2,982.0	1.59
2003	3,141.8	131.5	3,273.2	4.02
2004	3,154.0	333.1	3,487.1	9.55
2005	3,185.7	638.5	3,824.2	16.70

Source: USAC, Distribution of High Cost Support Between CETCs and ILECs.*

* Accessed Feb. 24, 2006 at http://www.universalservice.org/_res/documents/about/pdf/Distribution%20of%20HC%20Support%20Between%20CETCs%20and%20ILECs%20from%201998%20thru%20Q4%2005%20as%20of%202006.01.23.pdf.

High-cost support increased from about \$1 billion in 1996 to almost \$4 billion in 2005.

TABLE 3
LIFELINE AND LINK-UP SUPPORT
(NATIONAL TOTALS)

Year	Lifeline		Link Up		Total Low-Income Support (millions)
	Lines	Support (millions)	Lines	Support (millions)	
1988	1,828,862	\$ 31.952	105,758	\$ 1.991	\$ 33.943
1996	5,233,425	148.186	808,354	18.247	166.433
1998	5,380,726	422.006	2,195,417	42.463	464.469
2004	6,969,085	730.685	1,710,992	32.223	762.907
2005	NA	774.245	NA	34.320	808.465

Source: 1988 – 2004 data, FCC, 2005, *Universal Service Monitoring Report (Data Received Through May 2005)*, Tables 2.1 and 2.2. 2005 data, USAC, *2005 Annual Report*, p. 42 (line count data were not reported). The Lifeline figures include the cost of toll limitation service.

Link-Up Support

This federal program offsets one-half of the initial hook-up or connection fee (up to a maximum amount of \$30.00) and provides for deferred payment of up to \$200 over a one-year period during which time the customary interest charges are paid by federal support. Eligible subscribers on tribal lands can receive additional Link-Up support to fully cover any charges between \$60 and \$130, resulting in a maximum of \$100 in discounts on initial connection charges of \$130 or more.⁴¹

Size of the Lifeline and Link-Up Programs

The total cost of federal low-income programs was nearly \$763 million in 2004 and over \$808 million in 2005. Moreover, as seen in Table 3, the programs have grown considerably since passage of the 1996 Act. In July 2005, the FCC and NARUC launched “Lifeline Across America,” a nation-

wide program to draw more low-income consumers into federal and state Lifeline and Link-up programs.⁴² This program includes a Federal/State Working Group to address the problem of how to reach consumers who may be eligible for Lifeline and Link-Up and ensure they have access to information about the programs and how to apply. The Working Group, which includes staff members from the FCC, state commissions, and consumer advocates will address best practices, develop outreach materials, and provide training. If this program is successful, the Lifeline and Link-Up programs may be expected to grow even more.

Rural Health Care Support⁴³

The Rural Health Care support mechanism operates to ensure that the net rates for telecommunications services (including internet access and satellite service) provided to eligible health care providers in rural areas is comparable to the retail end-user rates

“Link-Up” offsets one-half of a customer’s initial hook-up fee.

TABLE 4
RURAL HEALTH CARE FUNDING

Funding Year*	Demand for Rural Health Care Support (millions \$)
2002	23.3
2003	26.3
2004	30.2
2005	41.1

Source: USAC, *Federal Universal Service Support Mechanisms Fund Size Projections for the Second Quarter 2006*, (January 31, 2006), pp. 16-18.⁴⁵

* The funding year runs from July to June. Thus, the 2005 funding year began July 1, 2005 and runs until June 30, 2006.

⁴⁵ Accessed Feb. 24, 2006 at: <http://www.universalservice.org/about/governance/fcc-filings/2006/Q2/FCC%202Q2006%20Quarterly%20Demand%20Filing.pdf>

available for equivalent services in non-rural areas. To receive support, eligible rural health care providers must apply for the support and use the most cost effective provider of the service being subsidized. Rural Health Care is by far the smallest of the four programs; the FCC has capped the size of the rural health care fund at \$400 million, but as shown in Table 4, it has yet to surpass \$50 million.

Schools and Libraries Support⁴⁴

The Schools and Libraries support mechanism, commonly known as the E-rate Program, provides discounts to eligible institutions when they purchase eligible telecommunications services, voicemail, Internet access, and internal connections. Discounts range from 20 percent to 90 percent based on the percentage of students who are eligible for the national school lunch program (or a federally approved alternative mechanism) and on whether the school or library is located in a rural area. Eligible institutions apply

to USAC's Schools and Libraries Division for the discount and must seek competitive bids for the discounted services. If their application is approved, eligible institutions receive a commitment letter, which they use to obtain equipment or services. After construction, equipment delivery, or service provision, USAC reimburses the provider or the eligible institution.

Size of the Schools and Libraries Program

The FCC has capped the Schools and Libraries mechanism at \$2.25 billion annually.⁴⁵ Therefore, USAC cannot commit more than that amount unless it has surplus funds from prior years.⁴⁶ If requests for support exceed the cap, USAC rations the available funds to ensure that the most disadvantaged schools receive first priority. Because the Schools and Libraries Program supports the purchase of equipment and installation in addition to monthly service fees, and work must be completed before reimbursement is

The "E-rate" gives discounts to schools and libraries for services like Internet access.

TABLE 5
USAC 2005 DISBURSEMENTS AND
ESTIMATED 2006 UNIVERSAL SERVICE SUPPORT

Program	2005 Disbursements	2006 Estimated Funding
High Cost	\$ 3.824 billion	\$ 4.2 billion
Low Income	809 million	820 million
Rural Health Care	26 million	45 million
Schools & Libraries	1.862 billion	2.25 billion
Total	\$ 6.520 billion	\$ 7.3 billion

Source: 2005 disbursements, USAC, *2005 Annual Report*, p. 7; 2006 estimates, USAC, *Universal Service Fund Facts**

* USAC, *2005 Annual Report* available at <http://www.universalservice.org/res/documents/about/pdf/annual-report-2005.pdf>; USAC *Universal Service Fund Facts* available at <http://www.universalservice.org/about/universal-service/fund-facts.aspx>; accessed April 12, 2006.

From 1998 through 2005 federal universal service programs cost \$37.8 billion.

made, there may be a significant lag between commitment of funds and disbursement. As of June 6, 2005, USAC had committed \$2.2 billion and disbursed almost \$1.5 billion of Funding Year 2002 funds, committed over \$2.6 billion and disbursed over \$1.4 billion of Funding Year 2003 funds, and committed over \$2.0 billion and disbursed over \$254 million of Funding Year 2004 funds.⁴⁷

TOTAL FEDERAL UNIVERSAL SERVICE SUPPORT

From 1998 through 2005, USAC estimates that \$37.8 billion had been disbursed in total for the four programs (high-cost, low-income, rural health care, and schools and libraries).⁴⁸ USAC's disbursements during 2005 and estimated 2006 support levels are shown in Table 5.

USF COLLECTION AND DISBURSEMENT PATTERNS

Disbursement by State 1998-2005

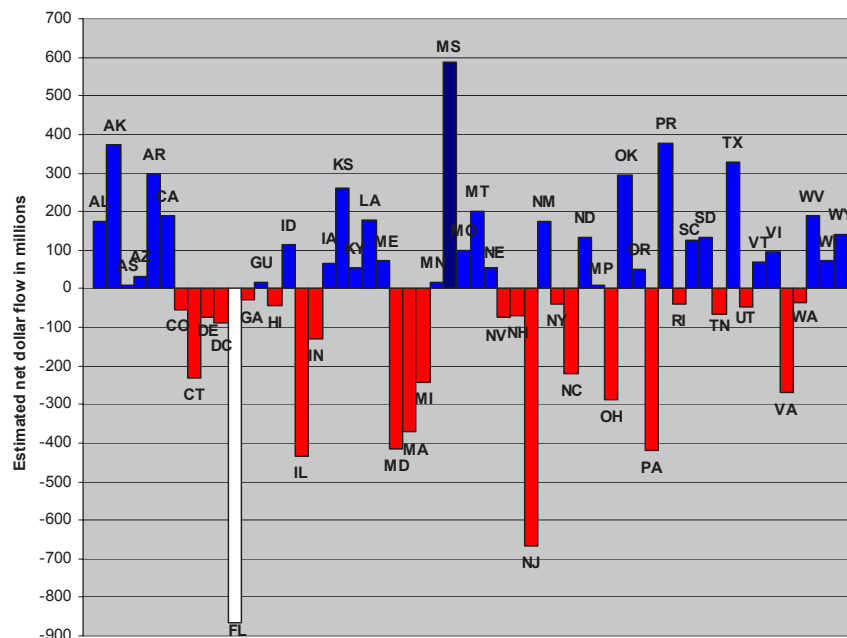
Based on disbursement information provided by USAC for the High-Cost, Low-Income, Schools and Libraries, and Rural Health Care programs, during the calendar years 1998 to 2005,⁴⁹ USAC disbursed a total of \$37.8 billion dollars for all USF programs.⁵⁰ California, Texas and New York, the three most populous states, received the highest disbursements. California ranked first with total USF disbursement of \$4.48 billion dollars; Texas was second, with a total disbursement of \$2.89 billion; New York was third, with \$2.33 billion dollars. Outside the continental states, Puerto Rico received the highest disbursement (\$1.14 billion) for the period, ranking sixth among

all jurisdictions, after Mississippi and Georgia. Considering only the states and the District of Columbia, Delaware, the District of Columbia, Rhode Island, and New Hampshire received the lowest disbursements for the period. Delaware was lowest, with a disbursement total of \$13.6 million dollars; the District of Columbia was second lowest at \$48.2 million.

The analysis of the contributions to and payments from the universal service support mechanisms for the 50 states, the District of Columbia, and the other jurisdictions shows marked disparities among the jurisdictions. As shown in Figure 7, during the 2001-2004 period, the majority of jurisdictions (32) had a positive net flow of USF dollars for the four support mechanisms. The

amounts of positive net flows for the four-year period ranged from \$9 million for American Samoa to \$587 million for Mississippi. Puerto Rico (\$375 million) and Alaska (\$374 million) ranked second and third, respectively. Among the states, Texas shows the fastest increase in positive net flows for the 2001-2004 period, jumping from almost \$19 million in 2001 to \$116 million in 2004. From 2001 to 2004, seven jurisdictions (Alaska, Arkansas, Kansas, Mississippi, North Dakota, Oklahoma, and Puerto Rico) reported positive net flows of more than \$40 million per year.

About half the states have a positive net flow of USF dollars; 24 jurisdictions tend to contribute more than they receive in payments.



Source: Federal-State Joint Board on Universal Service, *Universal Service Monitoring Report*, 2002-2005, Table 1.12.

Fig. 7. Estimated net dollar flow for the universal support mechanisms by jurisdiction (2001-2004).

By almost any standard, the goal of universal service has been largely achieved.

Factors affecting the percentage of households with telephones include income, ethnicity, age, size, and employment status.

On the other hand, 24 jurisdictions tended to contribute more than they received in payments during this period. The amounts of negative net flows for the 2001-2004 period ranged from -\$29 million (Georgia) to -\$867 million (Florida). New Jersey (-\$667 million) and Illinois (-\$434 million) ranked second and third, respectively. Of the states with a negative net flow, only four (Delaware, Florida, Maryland, and Michigan) had increases in their level of negative net flows every year; in most jurisdictions, the annual level of negative net flows fluctuated up and down over the period; the exception was North Carolina, which showed a constant reduction in its levels of negative net flows.

California is an interesting case, being the only state that shifted from a high positive net flow in 2001 (\$201 million) and 2002 to a negative net flow in the last two years (-\$37 million in 2004). Meanwhile, Iowa, Kentucky, and Minnesota have shifted from a negative to a positive net flow in the last years. Finally, Missouri and the Northern Mariana Islands are the two jurisdictions that are closest to breaking even in the ratio of contributions to payments, with positive net flows of only \$377 thousand and \$699 thousand, respectively.

UNIVERSAL SERVICE RESULTS

Aggregate National Penetration

By almost any standard, the goal of universal service has been largely achieved. Household penetration rates have been above 92 percent for

some time, and the FCC reports that in July 2005 the average telephone penetration rate in the United States was 94 percent, up 3.6 percent from 91.4 percent in November 1983.⁵¹ Moreover, this figure may tend to understate penetration somewhat, since some “wireless only” households may not be properly accounted for. This may explain the drop in measured penetration in the 2002-2004 period shown in Table 6 and Figure 8.⁵²

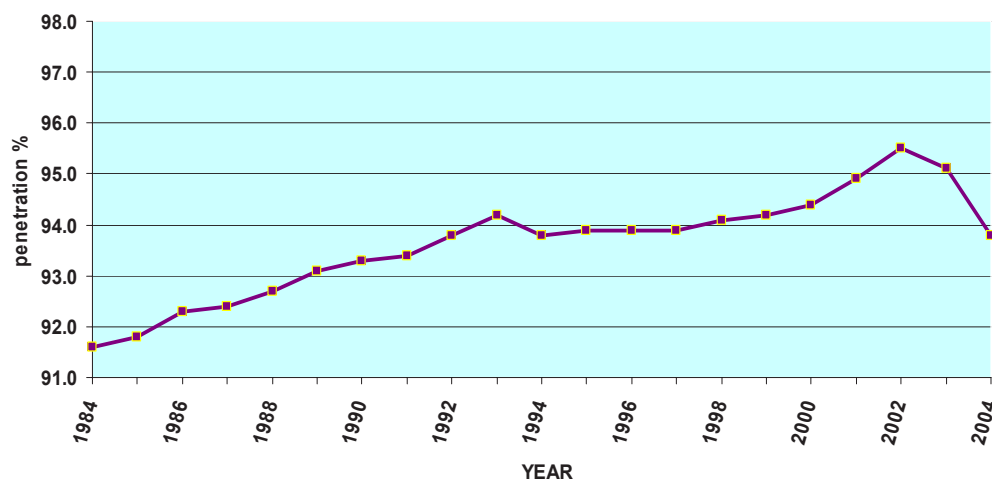
At a disaggregated or stratified level, factors affecting penetration include:⁵³

- **Income:** penetration was 79.8 percent for households with annual incomes below \$5,000 and 98.5 percent for households with incomes between \$75,000 and \$99,999
- **Ethnicity:** penetration was 94.7 percent for households headed by whites, 89.7 percent for households headed by blacks, and 89.1 percent for households headed by Hispanics⁵⁴
- **Age:** penetration rates ranged from 87.6 percent for households headed by a person under 25 to 95.8 percent for households headed by a person over 70
- **Size of household:** one-person households had a penetration rate of 90.6 percent; households with two to five persons had a penetration rate of 95.3 percent
- **Employment status:** a 93 percent penetration rate for unemployed adults and a 95.3 percent rate for employed adults

TABLE 6
ANNUAL AVERAGE PENETRATION RATES AS A
PERCENTAGE (1984-2004)

Year	Average Annual Penetration	Year	Average Annual Penetration
1984	91.6	1995	93.9
1985	91.8	1996	93.9
1986	92.3	1997	93.9
1987	92.4	1998	94.1
1988	92.7	1999	94.2
1989	93.1	2000	94.4
1990	93.3	2001	94.9
1991	93.4	2002	95.5
1992	93.8	2003	95.1
1993	94.2	2004	93.8
1994	93.8	2005*	94.0

Source: Belinfante, 2005b, Table 3. *2005 penetration rate is the July 2005 estimate.



Source: Belinfante, 2005, Table 3.

Fig. 8. U.S. annual average penetration 1984-2004.

TABLE 7
LOW INCOME PENETRATION AS A
PERCENTAGE (1984-1997)

Lifeline Category	March 1984	March 1997	Percentage Change
With State Assistance	79.3	85.8	6.5
Without State Assistance	83.6	86.9	3.3
Average All States	80.1	86.0	5.9

Source: Belinfante, 2005a, Table 1.

Low-Income Penetration

Penetration increased more in states with both federal and state lifeline assistance than in states with only federal assistance.

Perhaps more important for measuring the success of universal service policies is the fact that low-income penetration (households below \$10,000 income in 1984 dollars) rose from 80.1 percent in 1984 to 88 percent in 2004.

Between March 1984⁵⁵ and March 1997, low-income⁵⁶ penetration increased 5.9 percent, from 80.1 percent to 86 percent, which is over two times larger than the 2.1 percent increase in overall household penetration over the same period.⁵⁷ Moreover, as shown in Table 7, penetration increased more in states with state as well as federal Lifeline assistance than in states in which only federal assistance was available.⁵⁸

Table 8 shows the changes in low-income penetration between 1997 and 2004.⁵⁹ States with full (\$3.50 per month per line, or more) or nearly full assistance showed larger increases in low-income penetration than did states with lower or no state assistance.

There are still pockets of low penetration.

Figure 9 shows the time trend of the three largest federal universal service programs (high-cost, low-income, and schools and libraries) along with the household penetration rates for groups of low-income households (below \$10,000 and between \$10,000 and \$20,000 in 1984 dollars). The measured decrease in penetration in the two low-income groups may be due to the measurement problems caused by wireless substitution, as noted above.

Low-Penetration Pockets

Although universal service has been generally achieved, there are low-penetration pockets. As noted above, the FCC and states are engaging in outreach to ensure that the Lifeline and Link-Up programs reach eligible subscribers, and there are special programs to aid subscribership on Indian reservations and tribal lands.⁶⁰

Though universal service policy has traditionally focused on wireline telephony, the FCC and the U.S. Department of Agriculture's (USDA)

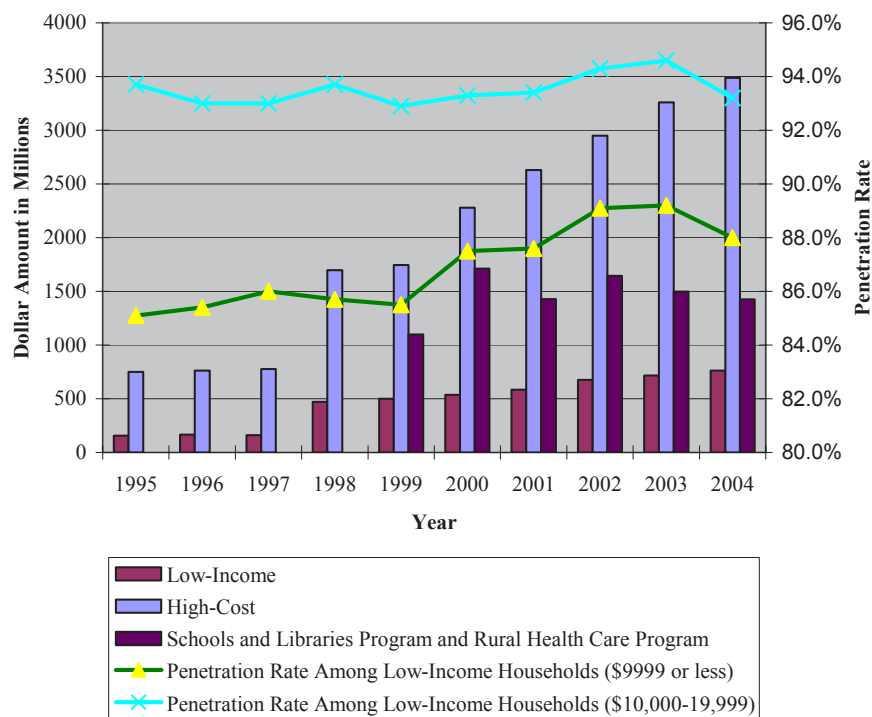
TABLE 8
LOW-INCOME PENETRATION AS A
PERCENTAGE (1997-2004)

Lifeline Category*	March 1997	March 2004	Percentage Change
Full Assistance	86.4	89.4	3.0
Nearly Full Assistance	83.4	87.0	3.6
Intermediate Assistance	87.5	88.5	0.9
Basic Assistance	87.6	85.5	-2.1
Average All States	86.0	88.0	2.0

Source: Belinfante, 2005a, Table 2.

Percentage of low income penetration improved to 88 percent from 86 percent between 1997 and 2004.

* “Full Assistance” states provide \$3.50 or more in state assistance. “Nearly Full Assistance” states provided slightly less than that required for the maximum federal matching (in most cases, \$3.50 support was provided to most but not all lifeline customers, with the average being \$3.00 per line per month). “Intermediate assistance” states had assistance between \$0.00 and \$3.00 per line per month. “Basic Assistance” states provided no state Lifeline support. See Belinfante, 2005a, p. 5.



Source: FCC, 2005 Monitoring Report and Belinfante, 2005a.

Fig. 9. Federal USF funding and low-income penetration 1995-2004.

Schools and libraries overwhelmingly consider the E-rate of great benefit.

Rural Utility Service (RUS) have established a Joint Federal Rural Wireless Outreach Initiative, which is a partnership between the FCC's Wireless Telecommunications Bureau, RUS, and private industry, to coordinate activities and essential information on programs, financial and other assistance regarding telecommunications opportunities for rural communities. The objective of this initiative is to encourage greater access and deployment of wireless services to enhance economic development throughout rural America.⁶¹

Impact of the Schools and Libraries Program

To have a more in-depth view of the impact of the E-rate program on its beneficiaries, Universal Service Administrative Company (USAC) began an initiative in January 2005 to conduct annual visits to one thousand schools and libraries selected at random. Based on information for more than 851 sites, as published by USAC, 93 percent of applicants considered that the USF support was of "great" benefit to them, 6 percent stated that it was of "some" benefit, and only one percent of those interviewed noted that the support had been of no benefit to the school or library.⁶² The applicants apply the support received from the fund to different purposes, including public safety, distance-learning opportunities, preparation for state-mandated tests, as well as to provide technologies to students with disabilities. The initiative has also allowed USAC to verify the purchase and installation of equipment bought with the support, and to increase the outreach of the program.

Policies that forbid disconnection if customers pay at least the local portion of their bills have been successful.

Non-Price Universal Service Policies

Though much of universal service policy aims at keeping basic access affordable, non-price policies may also play a role in promoting or maintaining subscribership levels. Many people who do not have a phone may have had one and been disconnected for non-payment. Policies that aim at reducing the level of disconnections and/or making it easier for disconnected customers to be reconnected may also increase penetration.⁶³

In states without a "do-not-disconnect" (DND) policy, a local exchange carrier (LEC) can give customers an ultimatum to either pay the phone bill in its entirety (local charges plus other types of charges) or be disconnected. In states with a DND policy, a customer cannot be disconnected from the local network so long as they pay at least the local portion of their bill. Customers may, however, lose access to other services such as long distance for non-payment of those charges.⁶⁴

In 1998, the FCC identified 18 states as having a DND policy under which LECs were prohibited from disconnecting consumers' local service as long as they continued to pay the local portion of their bills.⁶⁵ Table 9 compares penetration rates and changes in penetration rates for all households and for low-income households over the period March 1984 to March 1999 for the eighteen states that had a DND as of December 1998 and states that did not have a DND policy. States with a DND policy were partitioned

TABLE 9
COMPARISON OF PENETRATION RATES IN STATES WITH AND WITHOUT DO-
NOT-DISCONNECT (DND) POLICIES AS A PERCENTAGE (AS OF MARCH 1999)

Category	March 1984	March 1999	Percentage Change	March 1984	March 1999	Percentage Change
	All Households			Low-Income Households		
States With DND policies For at Least Five Years	93.1	95.8	2.7	81.8	90.6	8.7
States With DND Policies For Less Than Five Years	93.3	94.9	1.6	82.1	86.1	4.0
States Without DND Policies	91.2	93.4	2.1	79.2	84.2	4.9
Total United States	91.8	94.0	2.1	80.1	85.5	5.5

Source: Belinfante, 2000, Table 1.

into those that had had a DND for less than and more than five years.

From March 1984 to March 1999, penetration increased more in states that had DND policies in effect for more than five years than for either of the other two groups. However, penetration increased less in states that had DND policies for less than five years than in states with no DND policy.⁶⁶

Other Support Channels

The provides loans and grants to facilitate the deployment of telecommunications infrastructure in rural America. Established by amendment to the Rural Electrification Act in 1971, the Rural Telephone Bank has been providing supplemental financing for telecommunications companies and cooperatives. It was designed to ensure rural telephone systems' access to private sources of capital by establishing a supplemental credit mechanism to which borrower

systems may turn for all or part of their future capital requirements.⁶⁷

Aside from the general loans and grants programs to improve rural business and industry, USDA's RUS has several loans and grants programs targeted at telecommunication networks. The Telecommunications Loans program has offered an annual amount between \$480 and \$510 million for infrastructure improvement and expansion, under which RUS lends directly to rural telecommunication systems and guarantees loans made by other lenders. Complementing the E-Rate Program, RUS also has a Distance Learning and Telemedicine (DLT) Program, providing financial assistance for schools and health care facilities in rural areas. It offers grants up to \$500,000 on a competitive basis, as well as a loan and grant combination program on a non-competitive basis. As of 2006, the DLT program has funded 534 projects in 44 states and four U.S. territories totaling

The U.S. Department of Agriculture helps promote universal service through loans and grants.

Grants by the U.S. Department of Health and Human Services to support community based telehealth projects have been discontinued.

\$171 million.⁶⁸ In addition, RUS also provides loans, grants and loan guarantees to support acquisition and construction of broadband facilities in under-served rural areas under programs such as the Broadband Grant Program.

The U.S. Department of Health and Human Services had a Telehealth Network Grant to support community-based telehealth projects, providing approximately \$5 million a year. It was discontinued after 2004 because of insufficient funding.

The National Telecommunications and Information Administration under the U.S. Department of Commerce had a Technology Opportunities Program (TOP) from 1994 to 2004. The TOP awarded matching grants to public and non-profit organizations to demonstrate practical applications of telecommunications and information technologies. It awarded 610 grants, totaling \$233.59 million and leveraging \$313.7 million in local matching funds.⁶⁹

Competition may enhance universal service in some ways, but some households are likely to be left out.

Universal Service and Competition

To the extent that the goals of the 1996 Act (lower prices and higher quality services) are realized, competition may enhance universal service, since entrants may offer service and pricing packages that attract new subscribers, and competition may tend to put pressure on incumbents to control and reduce cost. However, competitive markets are driven by profit opportunities, whereas universal service policy is driven by social and equity goals. Without a strong

commitment to universal service, some segments may not be well served by competitive market forces. Bernt (2001) has considered the balancing act that regulators must attempt to ensure that neither competitive nor universal service goals are unmet. Gabel and Pollard (1995) evaluated the experience of New Zealand and the United Kingdom with respect to competitive entry, universal service, and quality of service, finding that the goals can be compatible.

STATE UNIVERSAL SERVICE PROGRAMS

As noted above, the Telecommunications Act preserved state authority with respect to intrastate universal service support. Moreover, it stated that “there should be specific, predictable and sufficient *Federal and State* mechanisms to preserve and advance universal service.”⁷⁰ Some states already had universal service support mechanisms; other states have established them since passage of the 1996 Act. These mechanisms include various targeted and untargeted USF programs depending upon the mandate from the state legislature, the resources of state public utility commissions, and the needs and cost basis in the state. According to previous NRRI surveys of state universal service funds,⁷¹ the number of states with state USF programs increased from 14 in 1998 to 24 in 2002.⁷² As of March 2004, all but four states have provided state support for federal Lifeline and Link-Up programs.⁷³

The NRRI 2002 Survey shows that 24 of the 51 jurisdictions (47 percent)

had either a functioning universal service fund, a functioning fund under revision, or a fund that was approved but not yet functioning. This was an increase of five states compared to the result of the 1998 survey. In most cases, the state USFs were mandated by the state legislature. Half the jurisdictions used the FCC definition of universal service; half had their own definitions. The services supported by the state USFs mainly covered basic or essential local services with some exceptions for educational or rural health care institutions. Fifteen of 28 states (54 percent) required wireless providers to contribute to the funds, and Nevada and Texas designated wireless providers as ETCs. The most commonly used mechanism for funding state universal service support was a percentage surcharge on revenues (22 states). The surcharge was usually applied to intrastate revenues, though in some cases it was applied to a mix of intrastate and interstate revenue. The next most common mechanism was a line charge (four states). Other funding mechanisms included a per-minute charge and a combination of several above-mentioned approaches. In regard to administration of the state funds, 15 states employed a private organization and ten states used a public agency. Independent administrators were either selected through a competitive bidding process or selected or appointed by the state public utility commissions. Eleven states had an advanced technology or broadband deployment program. In most states, the advanced service programs were administered by another state agency.

In 2006, the NRRI updated the 2002 survey.⁷⁴ The survey result shows that as of April 2006, 22 jurisdictions (43 percent) have a state high-cost USF, a majority of which are mandated by the state legislature. Six of the 22 commissions, are either revising or considering revising their state high-cost USF. Among the 22 jurisdictions, all but five commissions require wireless mobile phone service providers to contribute to the state high-cost fund. Only two state commissions require facility-based VoIP providers to contribute to the state high-cost fund. The surcharge rates for state high-cost support and the size of the high-cost USF vary over a wide range across states. Eleven jurisdictions (50 percent) require a carrier to be an ETC to draw from the state high-cost USF. Among the 12 jurisdictions that use a cost standard for providing state high-cost fund, four jurisdictions use an embedded cost standard; two use an economic cost standard from the cost proxy models; and six use embedded cost for rural/small eligible providers and economic cost for non-rural/large eligible providers. Among the jurisdictions that use a third-party administrator, about half of them use Solix, Inc. (previously NECA Services) to administer the fund.

The 2006 NRRI survey on state USF mechanisms also shows that 33 jurisdictions (65 percent) have statewide Lifeline and Link-Up programs. The average monthly per-line support for each low-income household ranges from \$1.17 to \$13.30. The size of the fund ranges from \$101,757 to \$241 million. The state Lifeline and Link-Up programs can be administered by

Twenty-two jurisdictions have their own high-cost USF. Thirty-three have Lifeline and Link-Up programs.

Some states also have their own programs for schools and libraries, rural health, or advanced telecommunications services.

the state public utility commission, another state agency, a third-party organization, the service providers, or a combination of several entities.

The 2006 NRRI survey shows that as of April 2006, nine jurisdictions (18 percent) have state subsidy programs for schools and libraries; seven jurisdictions (14 percent) have state subsidy programs for rural health care facilities; and five jurisdictions (10 percent) have subsidy programs for advanced telecommunications services. All such programs were established after passage of the 1996 Act. In addition, eight jurisdictions have other types of state USF programs. The source of funding, distribution, administration of the funds and the size of the funds vary across states.

UNIVERSAL SERVICE ISSUES

Today's policy is under attack for being both too broad and too focused, as well as too expensive.

Universal service has been a successful and popular policy, at least among its beneficiaries. However, it has its critics, and the current implementation of universal service policy is under attack both for being too broad, too expensive, too untargeted, and for being too narrowly focused—though not by the same groups.⁷⁵ Both the FCC, through the Joint Board, and Congress are considering revisions to universal service policy.

Improving the Sustainability of Funding

As noted above, the demand for federal universal service support has been growing, and the revenue base upon

which the surcharge is assessed has been shrinking due to a combination of declining interstate minutes of use⁷⁶ (resulting from increased competition from wireless and internet-based services) and falling prices (resulting from falling interstate access charges). The surcharge has exceeded 10 percent of interstate and international revenues for some time. If it continues to rise, it may further suppress revenues from this source, leading to a vicious cycle of rising surcharge rates, suppressing revenues and leading to higher sur-charge rates.⁷⁷

Recognizing the instability of a revenue-based funding mechanism, in February 2002, the FCC sought comment on a connection-based funding system, which would assess USF contributions based on the number and capacity of connections.⁷⁸ The FCC acted in response to market trends such as new entrants and increased competition from RBOCs entering long-distance markets, growth of wireless usage and migration to broadband platforms, and the marketing of packages of service, which bundle local and long-distance for a flat monthly charge.

A number- or connection-based approach would be more stable, and it could deal with the issue of broadband-based voice services and users that might otherwise avoid paying universal service support. However, a number-based approach could negatively impact customers who currently make few interstate or international calls.

Other proposals for stabilizing funding would expand the revenue base to include intrastate and broadband services. However, at least where intrastate services are concerned, the FCC does not currently have statutory authority to impose the surcharge on them.

Operationalizing the Statutory Terms “Reasonably Comparable” and “Sufficient”

In 2003, acting on a remand from the Tenth Circuit Court of Appeals, the FCC tried to address the question of what “reasonably comparable” means with respect to rate differentials between urban and rural areas and what “sufficient” means with respect to universal service support.⁷⁹ The FCC provided a more explicit definition of its high-cost standard to include a benchmark of two standard deviations above national average cost and moved to require states to compare rates in rural areas with the nationwide urban benchmark and certify comparability annually. The FCC was also seeking ways to induce states to implement their own universal service policies.

Notwithstanding the FCC’s 2003 attempt, the court remanded the matter back to the FCC. The court did not accept the FCC’s logic that basing universal service support on *costs* was closely linked to the statutory requirement that *rates* be reasonably comparable. In December 2005, the FCC issued a Notice of Proposed Rulemaking to address the latest remand.⁸⁰ These issues are still open to debate and interpretation, hopefully with a final resolution in the near future.

Determining What Should be Included in Universal Service

The traditional view of universal service focused on keeping the price of basic telephone service (sometimes called “plain old telephone service” or POTS) affordable, if necessary by subsidizing connections for truly low-income households in all areas and for all households and businesses in high-cost areas. This is an “affordability” standard that focuses on the cost of connecting to the network (network access), receiving, and making voice telephone calls. This is the standard embodied in the current definition and implementation of universal service. A more expansive view of universal service requires that innovative or advanced services (sometimes called “pretty amazing new stuff” or PANS) be available to all potential users. The 1996 Act included provisions that provided subsidies for schools and libraries to access advanced (broadband or high-speed internet) services, and there are proponents of including broadband capability or availability in the definition of universal service and the list of supported services. However, there is also some concern about adding additional costs to an already shaky universal service funding mechanism, and the Joint Board has, so far, declined to expand the definition and the list.

As noted above, the 1996 Act presumed that the concept of universal service would evolve, and services not then eligible for universal service support would become so. It is interesting that nearly ten years since the list of supported services was adopted,

The FCC has proposed basing universal service on phone numbers or connections instead of revenues.

Despite enormous technological developments, the Joint Board has so far declined to expand the applicability of universal service.

The FCC has clarified guidance to states on designation of eligible carriers.

there has been no change in it.⁸¹ This is especially interesting given the technological developments in telecommunications and information services.

Ensuring that Universal Service Support is Used Appropriately

In March 2005, the FCC clarified ETC requirements and gave permissive guidance to states on the public interest standard in rural areas.⁸² In that order, the FCC noted that, in certifying CETCs states could consider such factors as the benefits of increased consumer choice and unique advantages and disadvantages of the competitor applying for ETC status as well as impact on the high-cost fund. The FCC also noted that the public interest may be served by a state limiting the number of ETCs to lessen the strain on the high-cost fund.

Each ETC was asked to: “(1) provide a five-year plan demonstrating how high-cost universal service support will be used to improve its coverage, service quality or capacity in every wire center for which it seeks designation and expects to receive universal service support; (2) demonstrate its ability to remain functional in emergency situations; (3) demonstrate that it will satisfy consumer protection and service quality standards; (4) offer local usage plans comparable to those offered by the incumbent LEC in the areas for which it seeks designation; ...”⁸³

Moreover, the FCC is now requiring ETCs to provide the following on an annual basis: “(1) progress updates on

its five-year service quality improvement plan, ... explanations of how much universal service support was received and how the support was used to improve service quality in each wire center for which designation was obtained, and an explanation of why any network improvement targets have not been met; (2) detailed information on outages in the ETC’s network caused by emergencies, ... and steps taken to prevent a similar outage situation in the future; and (3) how many requests for service from potential customers were unfulfilled for the past year and the number of complaints per 1,000 handsets or lines.” States were encouraged to require all ETCs in their jurisdiction to file these reports.⁸⁴

The FCC has also instituted a proceeding to improve the management and oversight of the universal service funds. At issue is how to simplify and streamline management of the programs, improve oversight to protect the funds from potential abuse, provide for audits of beneficiaries and contributors, recover USF monies not used appropriately, and establish performance measures for the universal service programs.⁸⁵

Interrelationship With Other Issues

Universal service was once described as one leg of a three-legged stool, the other legs being access charges and local competition.⁸⁶ Universal service might just as well be thought of as one leg of a stool resting equally on access charges and jurisdictional separations. If you adjust one, you are almost certain to have to adjust one

Universal service policy is intimately connected to policy on competition, access charges, and jurisdictional separations.

or both of the others. As noted above, previous moves to reform and lower interstate access charges (the CALLS and MAG plans) led to increases in the SLC and to the creation of additional universal service funds (interstate access support and interstate common line support). The current push to reform and rationalize intercarrier compensation is similarly likely to lead to the creation of mechanisms to aid rural carriers.⁸⁷ Indeed, several proposals would create USF-like pots of money to offset revenues lost if access charges (intrastate, interstate, and reciprocal compensation) are lowered and brought under a common pricing structure.⁸⁸

Jurisdictional separations divides regulated costs between the interstate and intrastate jurisdictions.⁸⁹ Separations applies mainly to customer loop plant and some switching plant, since these items are used to provide interstate and intrastate service. As costs are divided, so are revenue responsibilities. Separations rules are now operating on an interim basis.⁹⁰ A revision of separations rules could shift revenue responsibility toward the state or federal jurisdiction and could have implications for federal and state universal service funds.⁹¹

PROPOSALS FOR UNIVERSAL SERVICE REFORM

As with most public policies that transfer billions of dollars and affect millions of people, there are proposals for reforming universal service. Some groups want to impose limits on the total size of funding, others want to

expand universal service to encompass broadband capabilities. We briefly consider some of these proposals.

The Progress and Freedom Foundation's Digital Age Communications Act⁹²

The Progress and Freedom Foundation (PFF) proposal calls for universal service to have as its goal securing affordable basic electronic communication services for low-income households and households located in high cost areas. It proposes the use of transparent, easy-to-administer distribution and contribution mechanisms that are economically efficient and competitively neutral. The proposal has three key features: (1) a cap on the overall size of the federal universal service fund; (2) block grants to encourage state governments to experiment with alternative subsidy mechanisms; (3) a numbers-based funding mechanism combined with an alternative minimum tax to discourage “number bypass.”

This proposal would discard the requirement that rates be reasonably comparable in rural and urban rates, and it suggests that funding for advanced services come from Congressional appropriations from general revenues. The state-level block grants would allow states to choose where to put their universal service support, especially if they are meeting universal service targets. PFF is critical of current USF policy that uses universal service to support multiple connections to multiple networks in rural areas.⁹³ Though this policy ensures competitive neutrality

Current proposals for universal service reform include limitations on funding and expansion to broadband services.

A proposal by the Progress and Freedom Foundation would further focus on low income and high cost areas.

One current proposal is for reverse auctions for universal service providers: The lowest bidder would receive support and assume an area's universal service obligation.

by subsidizing both incumbents and entrants similarly, the cost is high, and some providers may be engaging in USF arbitrage.⁹⁴ PFF would base affordability in rural areas on the price of the service, income levels, and the cost of living in an area. Service might be regarded as affordable if cost of basic service was no more than 3 percent of the household income.⁹⁵ PFF believes a number-based funding mechanism would be more economically efficient than the current surcharges, since the demand for connections to the network is likely to be less elastic than the demand for services that are priced according to usage.

Reverse Auctions for Universal Service Subsidies

Current universal service policy supports all ETCs that serve high-cost areas. Early debates over universal service policy after the 1996 Act included proposals that would have carriers engage in competitive reverse auctions for the right to receive universal service support in an area—the lowest bidder would receive support and assume the universal service obligation for an area.⁹⁶ Though this approach was rejected in the FCC's initial implementation of universal service support, FCC Chairman Kevin Martin has raised the question of whether competitive bids for universal subsidies might be worth reconsidering, since subsidizing multiple networks could increase the cost of any one network. If the universal service carrier of last resort obligation and the right to receive USF support in an area went only to the low-bid network for

some period of time, we might avoid rising and possibly unsustainable USF contribution factors.⁹⁷

Legislative Proposals

As part of the general movement to rewrite the nation's telecommunications laws, there are various legislative proposals that would revise universal service. Recent legislative proposals would generally expand the funding base of universal service and allow support of broadband technologies.⁹⁸

The Boucher/Terry Resolution (HR 5072, The Universal Service Reform Act of 2006)

This Resolution by Representatives Rick Boucher (D-VA) and Lee Terry (R-NE) would broaden the base of USF contributions to include broadband service providers, allow carriers to use USF support to provide broadband services as well as voice services, allow the FCC to base contributions on numbers and/or revenues, place a cap on the overall size of the fund, allow the cap to grow with inflation and the number of rural loops, and require USF recipients to offer high-speed broadband service within five years unless the FCC extends the period.

The Burns Bill (S. 2256, Internet and Universal Service Act of 2006)

This Bill by Senator Conrad Burns (R-MT) would expand broadband services to rural America, broaden the base of contributors to the USF, and crack down on the misuse of E-rate funds. It would update and advance the definition of universal service and allow carriers to use

Recent legislative proposals would expand the funding base and support broadband technologies.

USF dollars to accelerate deployment of advanced communications and information services. The FCC would be required to complete a rulemaking to define what qualifies as advanced telecommunications infrastructure and broadband service and complete similar studies every three years to ensure that policy evolves with technology.⁹⁹

The DeMint/Ensign Bill (S. 2113, The Digital Age Communications Act of 2005)

This Bill by Senators Jim DeMint (R-SC) and John Ensign (R-NV) would base USF collections on phone numbers, cap high-cost support at current levels and create a “block grant” system administered by states. It would replace “reasonably comparable” rates and services with “affordable service” for high-cost areas. State USF programs would be allowed provided that they comply with federal regulations.

The Dorgan/Smith/Pryor Bill (S. 1583, the Universal Service for the 21st Century Act)

This Bill by Senators Byron Dorgan (D-ND), Gordon Smith (R-OR), and Mark Pryor (D-AR) would allow federal USF to be based on total revenues, including intrastate revenues, and would allow the FCC to expand funding sources to include numbers, connections or a hybrid method. It would preempt state authority over access charges and create a federal fund capped at \$500 million per year to support broadband in unserved areas.

CONCLUSION

This primer provides an introduction to universal service. Universal service is a large and challenging policy issue. It affects all telecommunications users and providers and represents billions of dollars in total support. As Congress, the FCC, and the states consider changes in programs underpinning a concept that dates from the beginning of telecommunications policy, commissioners may well wish to review the basic facts and ideas presented herein.

References

Alleman, James, Rappoport, Paul N., and Weller, Dennis. 2000. “Universal Service: The Poverty of Policy,” *University of Colorado Law Review* 71, No. 4: 849-878.

Belinfante, Alexander. 2000. *Telephone Penetration by Income by State (Data Through March 1999)*. Federal Communications Commission (FCC), Common Carrier Bureau, Industry Analysis Division. March. Available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/pntris99.pdf.

Belinfante, Alexander. 2005a. *Telephone Penetration by Income by State (Data Through March 2004)*, FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, March. Available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/pntris04.pdf.

Universal service affects all telecommunications users and providers and costs billions of dollars. This primer is an introduction to the policy, programs, and issues.

- Belinfante, Alexander. 2005b. *Telephone Subscribership in the United States (Data through July 2005)*. FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, November. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-262084A1.pdf.
- Bernt, Phyllis. 2001. *Balancing Competition and Universal Service: The Role of the Regulator Five Years After the Telecommunications Act*. Columbus, Ohio: The National Regulatory Research Institute, NRRI 01-06, February.
- Bluhm, Peter. 2006. *State Issues Regarding the Separations Freeze*, presentation to NARUC's Subcommittee on Telecommunications, Washington, D.C., February 11. Available at http://www.naruc.org/associations/1773/files/telecom_SeparationsFreeze_0206.pdf.
- Borrows, John D., Bernt, Phyllis A., and Lawton, Raymond W. 1994. *Universal Service in the United States: Dimensions of the Debate*. Columbus, Ohio: The National Regulatory Research Institute, NRRI 94-08, June.
- Cain, Paul and Macdonald, James M. 1991. "Telephone Pricing Structures: The Effects on Universal Service," *Journal of Regulatory Economics*. 3, no. 4 (December): 293-308.
- Crandall, Robert W. and Waverman, Leonard. 2000. *Who Pays for Universal Service?: When Telephone Subsidies Become Transparent*, Washington, D.C.: Brookings Institution Press.
- FCC. 2005a. *Trends in Telephone Service*, released June 2005. Available at http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend605.pdf.
- FCC. 2005b. *Expanding Telecommunications Access in Indian Country*, available at <http://www.fcc.gov/indians/itibooklet.pdf>.
- Gabel, David and Pollard, William. 1995. *Privatization, Deregulation, and Competition: Learning From the Cases of Telecommunications in New Zealand and The United Kingdom*. Columbus Ohio: The National Regulatory Research Institute, NRRI 94-32, January.
- FCC. 2005b. *Universal Service Monitoring Report (Data Received Through May 2005)*, released December 2005. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-262986A1.pdf.
- Kretchmer, Ruth K. and Donovan, Joseph E. 1999. "The High-Cost Fund: A Universal Dis-Service," *Public Utilities Fortnightly*, 137, no. 5 (March 1): 34-40.
- Lande, Jim and Lynch, Kenneth. 2006. *Telecommunications Industry Revenues 2004*, FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, March. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-264669A1.pdf.

Liu, Jing and Rosenberg, Edwin A. 2006. *State Universal Service Funding Mechanisms: Results of the NRRI's 2005-2006 Survey*. Columbus, Ohio: The National Regulatory Research Institute, forthcoming.

Milgrom, Paul. 1996. *Procuring Universal Service: Putting Auction Theory to Work*, Nobel Prize Memorial Lecture, Stockholm, Royal Swedish Academy of Sciences (Dec. 9, 1996). Available at <http://www.market-design.com/files/milgrom-procuring-universal-service.pdf>.

Mueller, Milton. 1997. "Universal Service and the Telecommunications Act: Myth Made Law," *Communications of the ACM*, 40, no. 3: 39-47.

Pitch, Peter K. 1997. *Reforming Universal Service: Competitive Bidding or Consumer Choice?* Washington, D.C.: Cato Institute, Briefing Paper No. 29. May 7. Available at <http://www.cato.org/pubs/briefs/bp-029.html>.

Progress and Freedom Foundation. 2005. *Digital Age Communications Act: Proposal of the Universal Service Working Group*, release 2.0. Washington, D.C.: The Progress and Freedom Foundation, December. Available at <http://www.pff.org/issues-pubs/books/051207daca-usf-2.0.pdf>.

Riordan, Michael H. 2002. "Universal Residential Telephone Service," in Martin Cave, Sumit Majumdar, and Ingo Vogelsang, eds. *Handbook of Telecommunications Economics, Volume 1: Structure, Regulation and Competition*. Amsterdam: Elsevier Science: 424-476.

Rosenberg, Edwin A. and Wilhelm, John D. 1998. *State Universal Service Funding and Policy: An Overview and Survey*. Columbus, Ohio: The National Regulatory Research Institute, NRRI 98-20, September.

Rosenberg, Edwin A., Lee, Chang Hee and Pérez-Chavolla, Lilia. 2002. *State Universal Service Funding Mechanisms: Results of the NRRI's 2001-2002 Survey*. Columbus, Ohio: The National Regulatory Research Institute, NRRI 02-10, June.

Weller, Dennis. 1998. *Auctions for Universal Service Obligations*, presented at the twelfth biennial conference of the ITS, Stockholm, June. Available at http://faculty-gsb.stanford.edu/wilson/archive/E542/classfiles/gte_colr_auctions.pdf.

Notes

¹ The idea implied by the phrase "universal service" has changed considerably over time. In 1907, AT&T president Theodore Vail is reported to have coined the phrase to mean that everyone should be connected to everyone else via a ubiquitous Bell telephone network. See Mueller, 1997.

² See 47 U.S.C. 151.

³ The data points in Figure 1 are based on decennial census data as reported by the FCC. Other authors, have used various sources to interpolate intermediate years. For example, Riordan (2002, Figure 1) shows penetration falling from over 40 percent in 1930 to just over 30 percent in 1935 and rising above 50 percent the late 1940s.

⁴ Preamble to S. 652, which became the Telecommunications Act of 1996 (Pub. L. 104-104, codified at 47 U.S.C. 151, et seq.). Available at <http://www.fcc.gov/Reports/tcom1996.pdf>.

⁵ The FCC may exempt carriers from contributing to federal universal service support if that carrier's contribution would be *de minimis*. Conversely, the FCC may require other providers of interstate telecommunications to contribute to universal service support if the public interest requires it.

⁶ 47 U.S.C. 254(b). Though the 1996 Act lists these principles, it also allows for adoption of "[s]uch other principles as the Joint Board and the [FCC] determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act."

⁷ 47 U.S.C. 254(a)(1).

⁸ 47 U.S.C. 254(c)(1).

⁹ 47 U.S.C. 254(f).

¹⁰ *Ibid.*

¹¹ The existence of network externalities does not, by itself, justify universal service subsidies. The size of the externality must also be considered. Once a network is reasonably well populated, the value of an additional subscriber may be quite small, and general subsidies may tend to benefit mostly people who would subscribe without any subsidies.

¹² Note that social policy has not gone so far as to *require* that households have a functioning telephone. Thus, telephone service has not risen to the level of smoke detectors in homes and seat belts in automobiles.

¹³ See FCC 97-157, *Report and Order* in CC Docket 96-45, May 8, 1997, ¶ 22 and ¶ 56; and 47 C.F.R. §54.101.

¹⁴ 47 U.S.C. 214(e).

¹⁵ Though support going to CETCs has been growing, it is still small relative to support flows to ILECs. In 2005, USAC estimated that nearly 17 percent of total high-cost support would go to CETCs. See Table 2.

¹⁶ For a more complete discussion of universal service support prior to the 1996 Act, see Borrows, Bernt, and Lawton, 1994.

¹⁷ Since subsidies flowed to and from many users, services, and areas, many subscribers both paid into and received support from subsidies of various sorts. A residential

customer in a rural area, who made few toll calls and had no enhanced services, was likely to receive relatively large net subsidies (especially if they qualified for Lifeline support). An urban business customer, who made numerous toll calls and used advanced services or features of the network, was likely to pay relatively large subsidies.

¹⁸ An implicit mechanism is one that is, in some sense, hidden from view. Neither payers or recipients of support under the mechanism are conscious of its operation, and its size may be difficult to determine. An explicit mechanism is more visible, and its operation and size are easier to determine.

¹⁹ Value of service was one justification for basing local rates, in part, on the local calling scope (the number of phones reachable without incurring toll charges). One result was that the retail price of local service rural areas and smaller towns was less than in urban areas, even though the per-subscriber cost of service was lower in urban areas than more rural ones.

²⁰ The loop refers to the wires (traditionally twisted pairs of copper wire but now including other media such as fiber) that connect the customer to the local switch; customer loop plant includes the lines, cables, poles, and other facilities and equipment used (depending on network architecture) to connect the customer to the local switch.

²¹ Support for speech and hearing impaired users, such as Telephone Relay Services, though part of universal service broadly defined, are covered under the Americans With Disabilities Act and are generally funded via per-line subscriber fees imposed by state commissions.

²² Universal service policy in telecommunications may be contrasted with the general lack of such policies with respect to electricity, natural gas, water, food, medical care, or housing. There are, of course, the LIHEAP (low-income household energy assistance program), food stamps, housing subsidies, and Medicaid programs, but these are means-tested programs that correspond most closely to the Lifeline and Link-Up programs. There are not broad-based universal service programs for these goods

and services. Some aspects of universal service in telecommunications might be analogous to the flat-rate pricing of first-class mail by the U.S. Postal Service: there are clear cost differences depending on the distance between sender and recipient and on the density of postal customers in each area, but social/political policy has chosen to eliminate any price difference in favor of nation-wide rate averaging. This policy is maintained by the Postal Service's legal monopoly on first-class mail; it would not be sustainable in a competitive market (low-cost areas would attract competition, eliminating the source of the subsidy for high-cost areas).

²³ See FCC, *Proposed Second Quarter 2006 Universal Service Contribution Factor*, DA 06-571 in CC Docket 96-45, released March 13, 2006. Available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DA-06-571A1.pdf. Current quarterly contribution factors are available from the FCC's website at http://www.fcc.gov/wcb/universal_service/quarter.html.

²⁴ Between 1997 and 2005, end-user toll revenues decreased 45 percent (from \$89 million to \$49 million). During the same period, end-user local revenues increased 20 percent (from \$69 million to \$83 million), and end-user wireless revenues increased 240 percent (from \$30 million to \$102 million). See Lande and Lynch, 2006, Table 1.

²⁵ This discussion relies heavily on the discussion in FCC, 2005b, Section 3.

²⁶ Though cost-based rates might, indeed, prove a barrier to subscription by low-income households in high-cost areas, analysts sometimes question the need for large and broadly applied subsidies in high-cost areas. These questions arise from the low share of household budgets devoted to telephone service and the relatively low estimates of the price elasticity for basic telephone access. See for example, Cain and Macdonald, 1991.

²⁷ 47 U.S.C. 254(b)(3).

²⁸ On July 1, 2004, the previous long-term support (LTS) mechanism was merged into the ICLS mechanism. See FCC, 2005b, p. 3-1.

²⁹ Non-traffic-sensitive (NTS) costs do not vary by network usage (number of calls or minutes of use). A classic example of a non-traffic-sensitive cost is the cost of the line or local loop connecting an end user's home or business to a local exchange carrier's (LEC) switch. Given the network architecture deployed, this cost does not vary with the number or length of calls placed over the line.

³⁰ Previously, some implicit support for universal service came from toll access charges, which were set well above cost and contained a per-minute common-carrier line charge (CCLC) intended to collect part of the 25 percent of subscriber plant allocated to the interstate jurisdictions. The CCLC was criticized as being a usage-based charge to collect a largely fixed cost. It tended to discourage the use of long-distance service and was generally believed to be economically inefficient.

³¹ For information on the Coalition of Affordable Local and Long Distance Service (CALLS) plan, see FCC 00-193, Sixth Report and Order In CC Docket Nos. 96-262 and 94-1, Report and Order In CC Docket No. 99-249, Eleventh Report and Order In CC Docket No. 96-45, released May 31, 2000. For information on the Multi-Association Group (MAG) plan for reforming interstate access charges for rural carriers, see FCC 01-304, Second Report and Order and Further Notice of Proposed Rulemaking in CC CC Docket No. 00-256, Fifteenth Report and Order in CC Docket No. 96-45, and Report and Order in CC Docket Nos. 98-77 and 98-166, released Nov. 8, 2001.

³² The FCC extended the rural high-cost universal service support rules, which had been scheduled to expire on June 30, 2006. See FCC 06-69, Order in CC Docket 96-45 (In the Matter of Federal-State Joint Board on Universal Service) and WC Docket No. 05-337 (High-Cost Universal Service Support), released May 16, 2006.

³³ SNA support equals the difference between the uncapped and capped HCLS in the qualifying year less the difference between the uncapped and capped amounts in the base year. See 47 C.F.R. 36.605.

³⁴ See <http://www.universalservice.org/hc/incumbent-carriers/step01/safety-valve-support.aspx>.

³⁵ This discussion relies heavily on the discussion in FCC, 2005b, Section 2.

³⁶ The seven federal assistance programs are Medicaid, Food Stamps, Supplemental Security Income (SSI), Federal Public Housing Assistance (Section 8), the Low-Income Home Energy Assistance Program (LIHEAP), the National School Lunch Program's free lunch program, or Temporary Assistance for Needy Families (TANF).

³⁷ All states have approved Tier 2 support. See FCC, 2005b, p. 2-4.

³⁸ In 2004, Hawaii, Indiana, Louisiana, and New Hampshire provided no state Lifeline support.

³⁹ Total federal Lifeline support could be as much as \$10.00 per month per line—\$6.50 Tier 1 support to cover the federal SLC, \$1.75 Tier 2 support, and \$1.75 Tier 3 matching support.

⁴¹ FCC 2005b, Table 2.3. In 1998, the federal Lifeline support mechanism was expanded to provide Tier 1 assistance in all states. Prior to that, federal support was not available in states that provided no state support. The basic level of federal support was also increased in 1998. National data includes American Samoa, Guam, the Northern Mariana Islands, and Puerto Rico.

⁴¹ FCC, 2005b., p. 2-4.

⁴² See, *FCC and NARUC Launch "Lifeline Across America" to Raise Awareness of Lifeline and Link-Up Programs*, FCC Press Release, July 26, 2005. Accessed Feb. 24, 2006 at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-260129A1.doc.

⁴³ This section relies heavily on the discussion in FCC, 2005b, Section 5.

⁴⁴ This sections relies heavily on the discussion in FCC, 2005b, Section 4.

⁴⁵ 47 C.F.R. §54.507(a).

⁴⁶ Surplus funds might also be used to reduce future contribution rates.

⁴⁷ FCC, 2005b, p. 4-3.

⁴⁸ USAC, *Universal Service Fund Disbursements for the High Cost, Low Income, Schools and Libraries, and Rural Health Care Programs Calendar Years 1998-2005*, accessed Feb. 24, 2006 at http://www.universalservice.org/_res/documents/about/pdf/Overall%20Program%20Disbursements%20by%20State%20thru%202005%20as%20of%202006.01.24.pdf.

⁴⁹ See <http://www.universalservice.org/about/universal-service/fund-facts.aspx>.

⁵⁰ The total figure includes disbursements among the 50 states and the District of Columbia, as well as disbursements to American Samoa (AS), Guam (GU), the Northern Mariana Islands (MP), Puerto Rico (PR), and the Virgin Islands (VI).

⁵¹ See Belinfante, 2005b. The 1983 reference point is significant because it was just prior to the AT&T Divestiture, which was feared as possibly threatening to lower penetration by putting upward pressure on local rates.

⁵² The penetration figures are derived from a survey that is intended to be technology neutral. However, Belinfante (2005, pp. 2-3 and n. 2) makes note of difficulties in accurately accounting for wireless phones. Based on a special supplemental question administered to a portion of Current Population Survey respondents, in February 2004, 6 percent households were estimated to have only wireless phones.

⁵³ *Ibid.*, p.1.

⁵⁴ Though some of the difference may be explained by differences in average household income across ethnic groups, some difference remains even at higher income ranges.

⁵⁵ Federal Lifeline assistance was instituted in 1985, so 1984 is the baseline figure.

⁵⁶ Low-income was defined as being below \$10,000 in 1984 dollars.

⁵⁷ See Belinfante, 2005a., Table 1.

⁵⁸ Note that states without state Lifeline support began and ended with higher average low-income penetration than did states with state Lifeline support. States without Lifeline support might have concluded that additional support was not needed to achieve universal service goals.

⁵⁹ Effective in 1998, the federal Lifeline support mechanism was revised so that a basic level of assistance would be provided in all states, with \$1 in additional federal support provided for every \$2 provided by the state up to a maximum of \$1.75 per line per month in additional federal support. To obtain the maximum \$1.75 additional federal support per line per month, a state must provide \$3.50 per line per month in matching support.

⁶⁰ See FCC, 2005b, which details a number of programs and initiatives focused on telecommunications access in Indian lands.

⁶¹ See <http://wireless.fcc.gov/outreach/ruralinitiative/>.

⁶² USAC, *Focusing on Success: Examples of How the Universal Service Fund is Helping Schools and Libraries Around the Country*. (January 2006). Last downloaded on March 30, 2006 from http://www.universalservice.org/_res/documents/about/pdf/usf-success-stories.pdf.

⁶³ We don't consider the impact of prepaid local service offered by resellers or the ability of disconnected customers to shift to CLECs while owing an outstanding balance to an ILEC or other local provider.

⁶⁴ Belinfante, 2000, pp. 5-6.

⁶⁵ In some states, unless the consumer specifies which portion of the bill is being paid, the DND policy allows the LEC to prorate payments made by customers across all charges. If the customer does not pay in full and specify that they are paying only local charges, the LEC may declare local charges to be in arrears and disconnect the consumer. A "triage" system in which all payments go to local charges until those are paid, with payment in excess of local charges going to other services, is stronger in limiting disconnections. See Ibid.

⁶⁶ Ibid. p. 6.

⁶⁷ In February 2005, President Bush's FY2006 Budget proposed the dissolution of the Bank. The liquidation and dissolution process is currently underway. The dissolution process is expected to be largely completed by the end of FY2006.

⁶⁸ See U.S. Department of Agriculture, RUS, Telecommunications Program page: <http://www.usda.gov/rus/telecom/dlt/dlthighlights.htm>.

⁶⁹ See National Telecommunications and Information Administration Technologies Opportunities Program page: <http://www.ntia.doc.gov/top/howeare/howeare.htm>.

⁷⁰ 47 U.S.C. 254(b)(5), emphasis added.

⁷¹ Rosenberg and Wilhelm, 1998; Rosenberg, Lee, and Pérez-Chavolla, 2002.

⁷² The 1998 and 2002 NRRI surveys on state USFs did not distinguish between targeted and untargeted programs.

⁷³ See FCC, *Universal Service Monitoring Report*, 2005.

⁷⁴ Liu and Rosenberg, 2006.

⁷⁵ See, for example, Kretchmer and Donovan, 1999, who criticized the subsidizing states or regions based on costs without also considering customers' ability to pay. They argued that some states pay much more for universal service (especially the high-cost fund) than they receive and suggested the use of state-level block grants similar to the LIHEAP program.

⁷⁶ Interstate switched access minutes peaked at 566.9 billion in 2000 and fell to 422.4 billion in 2004, a decline in excess of 25 percent. See see FCC, *Trends in Telephone Service*, June 2005. Table 10.1. Available at: http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend605.pdf.

⁷⁷ Services upon which the surcharge is assessed tend to have a higher price elasticity than do basic access services.

⁷⁸ FCC 02-43, *Further Notice of Proposed Rulemaking and Report and Order* in CC Docket No. 96-45, Feb. 26, 2002.

⁷⁹ FCC 03-249, *Order On Remand, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order*, CC Docket 96-45, released Oct. 27, 2003.

⁸⁰ FCC 05-337, *Notice of Proposed Rulemaking* in CC Docket 96-45, released Dec. 9, 2005.

⁸¹ See, for example, FCC 02J-1, *Recommended Decision* in CC Docket 96-45, released July 10, 2002. The Joint Board recommended that no new service be added to the list of supported services, noting that (at ¶ 1) in doing so it was striking a balance “between ensuring the availability of fundamental telecommunications services to all Americans and maintaining a federal universal service fund of sustainable size.”

⁸² FCC 05-46, *Report and Order* in CC Docket No. 96-45, released March 17, 2005.

⁸³ *Ibid.*, ¶ 2.

⁸⁴ *Ibid.*, ¶ 4.

⁸⁵ See FCC 05-124, *Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking* in WC Docket 05-195 (Comprehensive Review of Universal Service Fund Management, Administration, and Oversight) and CC Docket 96-45 (Federal-State Joint Board on Universal Service), released June 14, 2005.

⁸⁶ See, for example, Susan Ness, *Remarks of FCC Commissioner Susan Ness before the Midwest Chapter of the Federal Communications Bar Association*, Chicago, Illinois, Oct. 15, 1996. Available at: <http://www.fcc.gov/Speeches/Ness/spsn618.txt>.

⁸⁷ See FCC 05-33, *Further Notice of Proposed Rulemaking* in CC Docket 01-92 (In the Matter of Developing a Unified Intercarrier Compensation Regime), released March 3, 2005.

⁸⁸ See, for example, NARUC’s intercarrier compensation proposal filed with the FCC on March 1, 2005, available at: http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6517399664.

⁸⁹ Separations rules are contained in Part 36 of the FCC’s rules (47 C.F.R. 36.1 to 36.641).

⁹⁰ In extending, on an interim basis, the freeze on separations rules and cost allocations, which were to expire on June 30, 2006, the FCC stated that, an extension of the freeze will provide stability for carriers while permanent reform of separations is considered. See FCC 06-70, *Order and Further Notice of Proposed Rulemaking*, in CC Docket No. 80-286 (In

the Matter of Jurisdictional Separations and Referral to the Federal-State Joint Board), released May 16, 2006.

⁹¹ For some illustrations of the issues for state regulators, see Bluhm, 2006.

⁹² See Progress and Freedom Foundation, 2005.

⁹³ It may be possible for rural subscribers to receive subsidies for both wireline and a wireless service if their wireless carrier has qualified as a CETC. The question of whether high-cost support should cover multiple lines (or multiple providers) has proven to be a difficult one, and it is not unreasonable to believe that some Lifeline recipients are also receiving wireless with a subsidy.

⁹⁴ This is likely part of the reasoning behind the FCC’s move to ensure that USF monies are used for universal service. See the discussion above.

⁹⁵ Progress and Freedom Foundation, 2005. p. 15.

⁹⁶ Milgrom (1996) lists as benefits of using reverse auctions for the universal service obligation that competition among potential providers would drive the level of subsidies necessary to ensure universal service and that there would be no further need for cost studies. He also notes that universal service auctions are not consistent with competition, so customers could be denied the benefits of a competitive market. He then suggests that the auction scheme might allow for multiple universal service providers in an area, thus allowing competition for customers as well as competition for universal service support. Weller (1998) and Alleman, Rappoport, and Weller (2000) favored reverse auctions for universal service subsidies; Pitch (1997) concluded that the benefits of consumer choice of universal service provider outweighed the benefits of reverse auctions.

⁹⁷ See *TR Daily*, March 29, 2006.

⁹⁸ All these proposals are available from the Library of Congress website: <http://thomas.loc.gov/>.

⁹⁹ See *TR Daily*, Feb. 14, 2006.

The National Regulatory Research Institute
1080 Carmack Road
Columbus, Ohio 43210-1002
Phone: 614-292-9404
Fax: 614-292-7196
www.nrri.ohio-state.edu

This report was prepared by the National Regulatory Research Institute (NRRI) with funding provided by the member commissions of the National Association of Regulatory Utility Commissioners (NARUC). The views and opinions of the authors do not necessarily express or reflect the views, opinions, or policies of the NRRI, NARUC, or NARUC member commissions.