Balhoff & Rowe, LLC

Universal Service Funding:

Realities of Serving Telecom Customers in High-Cost Regions

Implications for the Texas Universal Service Fund

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Summer 2007

Reviews and comments about *Universal Service Funding: Realities of Serving Telecom Customers in High-Cost Regions*

"Veteran telecom experts Balhoff & Rowe have provided policymakers with a great service. Their review of the Texas universal service program finally starts to answer questions that have been left hanging too long. Their work is groundbreaking in that it finally starts to answer, 'what is truly rural?,' 'what is truly high cost?,' and 'how do we have a universal service system that is responsive to that reality?' It is a template for a discussion that should be happening coast-to-coast."

Tony Clark
Chairman NARUC Telecommunications Committee
Commissioner North Dakota Public Service Commission

"Balhoff & Rowe brings stellar credentials and a well-deserved reputation for intellectual honesty and thoughtfulness to bear on a difficult problem: how is our universal service system working and how can we modernize it in the face of new challenges? This sort of careful study is a critical step to answering these questions and policymakers need to pay attention to what they have to say. The world of telecommunications is changing rapidly and the old universal service model is badly in need of repair, meaning that delay in engaging with the questions addressed in this important report is no longer an option."

Philip J. Weiser
Professor of Law and Telecommunications
Executive Director of the Silicon Flatirons Program
University of Colorado

"This report by Balhoff & Rowe does an excellent job of addressing the complications that have arisen as competition has been encouraged in smaller and smaller markets. We agree with the authors that public policymakers need to take a hard look at the real cost of competition for its own sake and the potential to jeopardize the benefits of Universal Service that have been established in rural communities over the past several decades. This report is an excellent resource for public policy decision makers and industry participants alike seeking to get their hands around these issues which have the potential to jeopardize investment returns and access to the investment capital that will be required to maintain the broadband networks of the future."

Frank Louthan
Senior Vice President
Equity Research
Raymond James Financial Inc.

Table of Contents

TABLE OF CONTENTS 3
Tables *5*
Figures *5*
EXECUTIVE SUMMARY 6
Overview of primary themes *7*
PART I: FINANCIAL REALITIES & NECESSITY OF UNIVERSAL SERVICE 11
1. Texas USF supports high-quality rural service at reasonable rates *12*
2. Texas rural incumbent providers—profitability and returns are concentrated and USF-dependent *12*
Wire centers analyzed in terms of "town center" and "outside of town" segments *13*
Excluding USF receipts, wire center returns are scarce *15*
Including USF receipts, wire center returns are improved, but highly concentrated *20*
Texas data—magnitudes of different investment costs in rural regions *24*
Summary comments *25*
PART II: COMPETITIVE TRENDS IN RURAL REGIONS – TARGETING PROFITS 26
Is there meaningful facilities-based competition in Texas rural regions? *27*
Cable Voice over Internet Protocol (VoIP) – a powerful threat *29*
PART III: UNIVERSAL SERVICE SYSTEM EVOLUTION: YESTERDAY, TODAY, AND TOMORROW 42
Summary of USF history *43*
A sharpened USF doctrine in providing financial support for policy-based services *46*
Understanding the risk: as the POLR is isolated in the high-cost region, new problems emerge *50*
Summary comments *52*
PART IV: POLICYMAKERS' CHOICES – MUST BE GROUNDED IN FINANCIAL REALITIES 53
Financial framework *53*
Four general approaches *54*
APPENDIX I: CURRENT SYSTEM OF UNIVERSAL SERVICE: INTERSTATE AND INTRASTATE OBLIGATIONS 56
Separations and Accounting: The Basics of How Carriers Recover Certain Costs *56*
Non-Rural Carriers *63*
Rural Carriers *65*
APPENDIX II: BRIEF HISTORY OF FEDERAL USF 70
Early Formation *70*
First Generation Universal Service, 1921-1970 ..... *71*
Second Generation USF, 1970s-1996 ..... *72*
Third Generation USF, 1996 to the Present *74*
APPENDIX III: TEXAS UNIVERSAL SERVICE EMBRACING THE CHALLENGES 77
SRILEC Universal Service Plan *78*
Texas High-Cost Universal Service Plan *79*
Hold Harmless Provisions of Texas Universal Service *79*
Contribution Methodology *79*

Scope of Support *80*
Eligibility *80*
APPENDIX IV: PURPOSE & METHODOLOGY 82
Purpose of the White Paper *82*
Understanding the financial data and realities of universal service *84*
APPENDIX V: ABOUT THE AUTHORS 85

Tables

Table 1: Wire center returns on investment for supported ILEC services, excluding USF receipts 17
Table 2: Calculation of lines an economically rational carrier would choose to serve, excluding USF receipts 19
Table 3: Wire center returns on investment for supported ILEC services, including USF receipts 21
Table 4: Calculation of lines an economically rational carrier would choose to serve, including USF receipts 23
Table 5: Annual line losses in surveyed 25 competitive rural exchanges 28
Table 6: Summary characteristics of geo-coded cable operations in rural regions 33
Table 7: ILEC serving areas with or without cable service, segmented by number of access lines in the wire center 35
Table 8: ILEC line density per square mile in areas with or without cable service, by wire center size 36
Table 9: ILEC per line investment in wire centers where cable competition is or is not available 37
Table 10: A pro-forma projection of competitive losses in rural regions 51

Figures

Figure 1: Illustration of wire center with "Town Center" area and "Outside of Town" areas 14
Figure 2: Financial Performance of All Wire Centers without USF payments 16
Figure 3: Sub-wire center returns on investment for supported ILEC services, excluding USF receipts 18
Figure 4: Financial performance of all wire centers with USF payments 20
Figure 5: Sub-wire center returns on investment for supported ILEC services, including USF receipts 22
Figure 6: Investment costs and density by wire center return groupings, including USF receipts 25
Figure 7: Cablevision VoIP quarterly penetration of homes passed 31
Figure 8: Cablevision: incremental quarterly change in VoIP penetration of homes passed 32
Figure 9: Clustered analysis of wire center service regions 39
Figure 10: Hypothetical analysis of investment & operating costs in 25 wire centers with actual facilities-based telecom competition 40
Figure 11: Monopoly Model of Support 43
Figure 12: USF Stages 45
Figure 13: Refined Rural Support Model 47
Figure 14: Total USF 1998-2006 75

Executive Summary

The Texas Legislature and the state's Public Utility Commission (PUC) have undertaken a review of the Texas Universal Service Fund (TUSF). The issues are complex and the consequences are significant for Texas policy, economic growth, competitive activity, and, importantly, many of the state's telecommunications consumers. The questions are appropriate and straightforward.

The questions are appropriate because *TUSF is and has been a critical support program for customers who would not otherwise be able to receive affordable and high quality telecommunications.* Further, *policymakers are appropriately evaluating how to allow for increasing competition, while avoiding distortions in competitive markets.* Finally, *Texas policymakers are considering how to prepare their state for technological growth so that economic and social benefits are available to all citizens over the next decades.*

The answers, however, are not as straightforward as they might appear. The simple answer is that Texas' system of USF generally has worked well in . . .

- Ensuring high-quality service in costly regions,
- Preserving stable and affordable rates, and
- Guaranteeing that telecom customers do not live in "have" and "have-not" areas.

To the credit of the Texas Legislature and PUC, the existing Texas system is specific and constructive. Further, the Texas approach appears to have some advantages over the federal system. At the same time, there are clear signs that, because of changing technologies and competitive factors, the fundamental assumptions and mechanisms underlying even the Texas system are at risk in the very near future. And these changing dynamics impact virtually all Universal Service Fund (USF) systems today—state and federal—which still rely to some degree on internal company cross-subsidies from other regions or lines of business. As competition spreads in even rural regions, the erosion of profitability in areas that were sources of internal company cross-subsidies will inevitably put at risk service to non-competitive, high-cost properties that generate low or no profitability. This paper suggests that uneconomic high-cost properties are being isolated and are in danger of failing if the USF system is not refined over the next several years. If the system of universal service falters, consumers and Texas will be harmed.

There are clear signs that the fundamental assumptions and mechanisms underlying the USF system are at risk in the very near future.

This report provides detailed data demonstrating that the USF system is at risk as low cost and more economically justifiable regions attract more competitors, while the costs in other regions remain stubbornly high and challenge the business rationale for serving these high-cost customers. The solution is not an arbitrary contraction in universal service by eliminating support monies as some suggest. Rather, the solution requires an informed and renewed

commitment to a better targeted universal service program in which the Provider of Last Resort ("POLR")[1] in uneconomic regions receives support for providing ubiquitous, high quality and affordable service to the public. Importantly, this paper proposes that it will be necessary to re-craft the system to allocate appropriate levels of USF to carriers assuming true POLR obligations in high-cost and uneconomic regions. It is also suggested that there are not multiple wireline carriers in the true high-cost regions, and may not be multiple carriers willing to accept true POLR obligations.

Overview of primary themes

This White Paper provides a framework for understanding key data fundamental to the Texas inquiry. Additionally, Texas policymakers are seeking to understand how best to serve the interests of all communications customers over the foreseeable future. Four themes have emerged from this analysis, as outlined below.

This White Paper provides compelling financial detail—more than previously has been available to the public—regarding the operating profitability and the specific levels of returns on investment in high-cost, low-density regions.

- **Positive returns on investment are generally concentrated in towns within rural regions, while areas outside of towns are demonstrably USF-dependent.** This report provides compelling financial detail—more than previously has been available to the public—regarding the operating profitability and the specific levels of returns on investment in high-cost, low-density regions. The financial data will allow policymakers to better appreciate both the theory of universal service support and, critically, the reality of the challenges in providing high-quality services at affordable rates to customers in the most sparsely-populated regions. To better highlight the issues, data are segregated into rural regions that are more populated and others that are less populated, revealing the relationship among population density, costs to serve, and economic viability of service. A clearer understanding of the financial realities should serve to sharpen the policymakers' understanding of the problem, the emerging challenges, and the shape of eventual solutions. Key findings include:

  - ***Without USF*, approximately 70% of rural customers could go without basic telephony due to insufficient returns on investment generated in providing "supported services."** Approximately 90% of the sampled rural wire centers generate insufficient returns on investment (ROI) *without USF* and would not support capital investment and operating expenditures.
  - **Even with USF payments, returns on investment are concentrated in certain rural regions while other areas remain sharply more uneconomic.** Including USF, the data in the study indicate that an estimated 112% of a rural carrier's net income is generated by 41% of total wire centers, by 55% of total lines, and by 41% of total investment. The data indicate, *even with current USF receipts*, an economically rational carrier, which is not obligated to serve all rural areas, could reasonably eliminate provision of "supported services" to about 58% of its rural customers, generally outside of town centers. These figures reflect the current

[1] Texas uses the term "Provider of Last Resort," which is known in some states as the "Carrier of Last Resort." In Texas, a telecommunications carrier that holds a certificate of convenience and necessity or a certificate of operating authority is required to offer all basic local telecommunications services to each customer in the company's certified area, and to provide continuous and adequate service in that area.. Generally, Providers of Last Resort or Carriers of Last Resort invest in and maintain networks capable of serving broad geographic areas with pre-determined high levels of reliability. These investments tend to have long lives and large fixed cost components, with cost recovery occurring over many years. These characteristics make it relatively difficult to decrease or increase expenditures on a customer-by-customer basis.

system of USF which averages the payments to carriers across some region, which in Texas is exchange-based and in the federal system is study-area-based.

- **Lines outside of rural towns (assumed to be more than 12,000 feet from the switch) require investment that is approximately 2 times higher than what is required in towns.** Outside the towns, line density is approximately 25% of that of the Town Center regions. Density affects costs to a great extent, and this study offers a quantification of the effects in one area.[2]

Competitors generally are not serving customers in truly low-density, high-cost regions.

- **Competitors generally do not now serve high-cost regions outside rural towns, and appear unlikely to serve those areas.** Using competitive information from communities where rural overbuilders are present and using geo-coded data concerning availability of cable service providers, this study builds a compelling profile that at least wireline competitors generally are not serving customers in truly high-cost regions. There is also good reason to believe that competitors will not serve those customers in uneconomic regions in the foreseeable future. This competitive behavior is neither "good" nor "bad," but simply rational. Policymakers must recognize that competition is spreading, but is not occurring and may not occur in certain areas. Further, the competitive patterns are creating pressures and revealing certain weaknesses in today's universal service systems. While there may be some wireless service in the low density regions, the anecdotal information indicates inconsistent and incomplete coverage, but the data about wireless services are admittedly incomplete.

  - **Incumbent line losses in overbuilt rural regions have risen to as much as 60% in certain Texas exchanges over the last five years.** With a combined line loss of 27% over the 5-year period, line losses have been large for rural incumbent carriers that have been targeted by overbuilders.
  - **Wireline competitors in rural regions are verifiably focused on the clustered townships.** On the basis of geo-coded data, this study represents that competition uniformly is not occurring in high-cost or Outside of Town regions, but is occurring in clustered rural regions that require relatively lower investment by the competitor. The data indicate that cable-served rural areas are approximately 31 times denser (in terms of telephone lines per square mile). Further, in the cable-served areas, the average per-line telephony investment is only 44% of that in the non-cable-served regions. Cable providers or other facilities-based investment is generally not occurring outside the clustered service areas.

Internal cross-subsidy systems almost certainly will prove inadequate to cope with emerging competitive patterns.

- **Targeted competition in areas of concentrated profitability renders reliance on internal company cross-subsidies increasingly risky and unsustainable, and puts customers in uneconomic regions at risk if the POLR carrier becomes financially distressed.** Historically, policymakers have relied at least in part on monopoly-based support systems founded on internal company cross-subsidies to maintain affordable rates in uneconomic service areas. Those internal cross-subsidy systems almost certainly will prove inadequate to cope with emerging competitive patterns.

[2] It is possible that a further refinement is not customers per square mile, but customers, per road mile, when calculating costs outside of towns. This study does not have such metrics but the analysis may be productive.

- **Loss of the clustered "town" lines drives up a POLR carrier's de-averaged costs in outlying rural regions.** Network investment and operating costs required to serve only the areas outside of the rural towns are about 15x the costs for a network to serve only the town areas.
- **In a monopoly system, policymakers were able to use cross-subsidies effectively; however, competition erodes sources of higher profitability and eliminates the ability to rely on internal company cross-subsidies.** Continuing policy reliance on systems that average costs and depend on internal company cross-subsidies appears to unsustainable. Further, the requirement that a single POLR carrier should depend on an averaged scheme may create anticompetitive obligations for those carriers.
- **Historically, other sources of internal cross-subsidies have eroded or disappeared.** Since the introduction of long-distance competition, the sources of other telecommunications cross-subsidies have disappeared rapidly (including long-distance, business, and urban services), causing systemic upheaval in the legacy regulatory scheme. In fact, the pattern has been clear that the USF systems have evolved as competition has eroded specific sources of internal company cross-subsidies.
- **Accelerating competitive services in certain clustered (town) rural residential markets will erode rural carrier economics and increase the need for explicit support.** Line losses likely will occur in areas of concentrated incumbent carrier (incumbent local exchange carrier or ILEC) economics, which are the clustered Town Center regions. Outside of Town areas increasingly will be exposed as very high cost and vulnerable customer regions. The loss of incumbent carrier profits, coupled with ongoing service requirements for uneconomic lines, could result in rural carriers experiencing financial distress rapidly.
- **In a competitive environment, a refined doctrinal statement regarding USF support will be required.**[3] Policymakers will likely be required to more sharply define the goals and purposes for USF. This paper suggests that policymakers might view explicit support as a critical "consideration" required for POLR carriers to assume specific costly, uneconomic service obligations that are important to policymakers. Effectively, policymakers are purchasing a defined "product," which is investment/operating support to provide reliable and regulated telecommunications services in uneconomic regions where those services would not otherwise be. USF is therefore payment for supplying network and specific services or it is "consideration" in exchange for providing network and services where no rational competitor would be inclined to build and operate its plant. Absent such investment-cost-based consideration or purchase of services, carriers should not be required to assume uneconomic obligations. In a simplified rendition, USF and POLR are two sides of one coin. Without fulfilling those obligations (ubiquity, quality of service, accountable regulatory oversight), there is no USF funding, and without USF funding, there is no POLR obligation. The net effect is a clearer doctrine, performance requirements, accountability to the public, and potentially an approach that results in slowing the growth in funding to multiple carriers that are now targeting more economic regions to receive non-investment-based monies.

It is increasingly apparent that in more competitive landscapes, it will be more problematic for policymakers to require telecommunications companies to absorb losses where USF support is insufficient.

Rural communications consumers depend on policymakers making informed policy choices grounded in financial reality. The financial data indicate that positive returns on investment in rural regions are concentrated in denser locales (towns) and competitors rationally are targeting those more economic service areas. The result is that policy goals will be at risk over the next half-decade and

[3] Current federal policy allows carriers to disaggregate their support so that it is targeted to the most costly regions. This is discussed in Appendix 1 at page 4.

beyond if policymakers are not able to ground policy decisions in demonstrable financial realities in order to craft sustainable solutions. This White Paper proposes that there are four general approaches that policymakers might choose.

1. **Leave the program unchanged**. It might be decided that the fund has been successful and whatever benefits might be derived from changes to the system are too minor to risk altering the Texas program. In short, TUSF has succeeded in achieving goals to provide ongoing services in high-cost regions. This approach affirms the success of the program but may not prove sustainable over the next half-decade if the conclusions of this White Paper are correct. However, material reductions to USF also appear to be risky in light of other findings in this paper.
2. **Reduce or raise the level of funding in a modest tweaking of the system.** The funding mechanisms might be left fundamentally unchanged—that is, the funds might be distributed in the same way on the basis of embedded costs and HAI models, but the level of funding might be slightly modified. This solution is not recommended as it does not seem to address underlying systemic issues, but is included as one of the potential outcomes. Importantly, if the carriers are permitted to raise rates to offset USF losses, the carriers should not be compelled to raise rates in competitive regions to offset USF reductions; policymakers should understand that the rate increases should be targeted to non-competitive regions where the rate increases will not have an anticompetitive impact. This approach again highlights the emerging problem with forced internal company cross-subsidies.
3. **Consider re-targeting all or most of the Texas USF to the out-of-town regions in light of the findings in this proceeding.** This White Paper highlights systemic concerns. Study area assignments of universal service monies do not appear to be sufficiently targeted in a way that can be sustained. It may be that improved mechanisms can be readily identified to target monies to specific high-cost areas. The authors of this White Paper know of no such ready solution, but again this is one potential outcome.
4. **Commit to a more refined study.** It appears to be realistic and responsible to commit to a detailed study, building upon the insights of this White Paper and the insights drawn from other participants in the current proceedings. The problem is that the Texas Legislature is seeking immediate guidance. The advantage, however, is that serious and well-constructed modifications might be made to a system that is currently under attack because of its dependence on intra-company allocations.

Part I: Financial Realities & Necessity of Universal Service

The first section of the White Paper focuses on Texas telephone company investment and operating data. The data highlight the financial challenges in serving customers in low-density, high-cost regions at affordable rates. The key messages in **Part I** are the following:

- **Texas rural customers have benefited from high quality service and affordable rates since 1999.** Quality of service metrics have remained high (evidence of ongoing infrastructure investment in rural regions). Further, stable, affordable rates in high-cost areas continue to be important indicators of consumer welfare, and are evidence that the PUC goals articulated in Texas PUC Dockets 18515 and 18516 are being met by the carriers that receive TUSF support.
- **If USF funding were not available and rates were not changed, nearly three-quarters of rural customers could go without basic telephony due to insufficient returns on investment generated in providing "supported services."** The Texas PUC's inquiry raises a question about the need for USF. *Without USF receipts*, the figures for 350,000 sampled lines reveal a stark reality—only 10% of the wire centers are contributing a satisfactory ROI (approximated at 10%). A more detailed view of sub-wire center economics reveals that an economically rational carrier might discontinue service to as much as 70% of its existing rural customer base if USF monies were not available and there were no policy obligations; the carrier would be required by simple economics to eliminate service outside of rural towns and in very small communities.
- **Today's system of averaging USF receipts across wire centers results in profits/returns being concentrated, leaving other outside of town areas as sharply uneconomic.** *Including USF receipts*, the data reveal income statements that are distorted. Approximately 112% of the sampled rural carrier net income is generated by 41% of the wire centers, 55% of total lines, and 41% of total investment. By contrast, a negative 25% of total net income is generated by 14% of the wire centers, 12% of total lines, and 18% of total investment. The data indicate that an economically rational carrier reasonably could eliminate the provision of "supported services" to about 58% of its rural customers based purely on the economics of service if the USF payments were to continue being averaged over the entire wire center.
- **Serious financial challenges are emerging within the current USF system in serving customers in low-density regions.** Telephone lines outside of rural towns appear to require about twice the investment needed to serve lines supplied directly by and close to central office switches.

1. Texas USF supports high-quality rural service at reasonable rates

One of the goals of the reforms flowing from the Texas Public Utility Regulatory Act (PURA) was to provide "service in high cost rural areas. . . . at reasonable rates . . ."[4] A brief review of the Texas carriers' records indicates that basic rates have been stable since 1999 and that service quality levels, as measured by the TPUC, have remained consistently high even for carriers serving areas where quality service and ubiquitous availability of such service can be prohibitively expensive. The TPUC reported that the election of PURA Chapters 58 and 59 regulations by the majority of the large and medium-sized ILECs has capped basic local service rates.[5] While basic local service rates and mandatory expanded calling service rates have been essentially unchanged, some modifications have occurred in vertical services pricing, packages and bundles, as well as term commitments and promotions.[6] At the same time, some of the packages have provided discounts that have been as high as 50%, according to the Commission.[7]

2. Texas rural incumbent providers—profitability and returns are concentrated and USF-dependent

Some commenters have questioned whether USF is necessary, particularly once a market is open to competition. The data are very powerful in verifying the need for support in rural regions, where very high investment and operating costs persist. Further, competitors selectively serve the most profitable, highest-density areas within those rural regions. It is notable that wireline competitors are rarely, if ever, present in regions that require the highest levels of investment, as will be more fully presented in **Part II.**

A second point is that the wireline network deployed by rural carriers, when supported by USF, is generally technologically up-to-date and a fundamental element in supporting other technologies such as wireless and IP services. This high-quality network is a testament to the success of the legacy regulatory system that supported the necessary returns on investment in high-cost regions.

To better ground the Texas policymakers' discussion about USF, this study attempts to bring greater clarity to the financial realities associated with serving high-cost rural regions. The initial section probes those costs—operating and investment—and their impact on potential profitability/return characteristics to determine whether state USF support mechanisms are needed.[8]

[4] *See* Texas PUC Docket 18515, Final Order, II.
[5] *See* Texas PUC, *2005 Report on Scope of Competition in Telecommunications Markets in Texas*, p. 30.
[6] *Id.*, pp. 30-35.
[7] *Id.*, p. 32.
[8] The data used in this study rely on forward-looking cost models similar to the HAI model that is mandated in Texas for the calculation of Universal Service payments. Texas mandated the use of the HAI forward-looking (economic) cost model for the largest carriers in the State to compute USF payments. The modeled cost and investment data used in this report are also forward-looking, with some of the inputs updated by the companies to reflect underlying and verifiable current costs. Notably, the modeling is consistent across the entire data set. The model provides investment data that often do not match the embedded costs—due to the fact that the actually-incurred costs may have been incurred in an era when costs were higher or lower. Reconciling forward-looking to embedded costs will be affected by other factors as well, including the timing of the investment and how much the assets have depreciated. The model also proposes operating costs, which are particularly helpful in this study since it is difficult and contentious to allocate overhead and other supra-wire-center operations to an individual switching center. While the model is not perfect, no other solution would match as well with Texas's HAI model. To the extent possible, every effort has been made to be fair and precise in preparation of the original data and in summarizing the results. Still, it should be noted that the specific data points will be different from one company to another and from one region to another. It is the conviction of the authors, however, that the data tell a valuable directional story for policymakers and clearly point to the underlying systemic problems and challenges.

Wire centers analyzed in terms of "town center" and "outside of town" segments

Part I summarizes operating financial data—first income statement information and then investment requirements—related to service in specific rural regions.[9] The data demonstrate that, *within wire centers, the most costly areas to serve are low density geographies outside of the clustered population centers, or "Outside of Town," where operating and investment costs are disproportionately high regardless of the wire center's size. In these Outside of Town regions, the data verify that financial support is required if network-based services are to continue to be provided at reasonable rates to consumers.*

The data supplied by the Texas companies revealed much higher investment and operating costs outside of the clustered population centers within wire centers. As a result, this study utilizes "sub-wire-center" data, categorizing the costs in terms of areas that are "Town Center" and "Outside of Town."

Using confidential Texas company-specific modeled data for "supported services," this White Paper focuses on sub-wire-center operating and financial data in an attempt to gain a more detailed insight into the financial reality of serving very high-cost regions. Those data were drawn from large numbers of wire-center operations serving a total of more than 350,000 lines in Texas. The revenues are *actual* "supported services" revenues, but the operating costs are forward-looking-modeled per-line calculations of the costs to provide these "supported services." The reason for using modeled costs is that sub-wire center costs are not tracked or certain allocations are necessary. The modeled costs represent a disciplined approach that is widely accepted as producing fair estimations. Further, the model has been tested with real operations and, according to expert sources, approximates the underlying operating costs for the carrier(s) in question.[10]

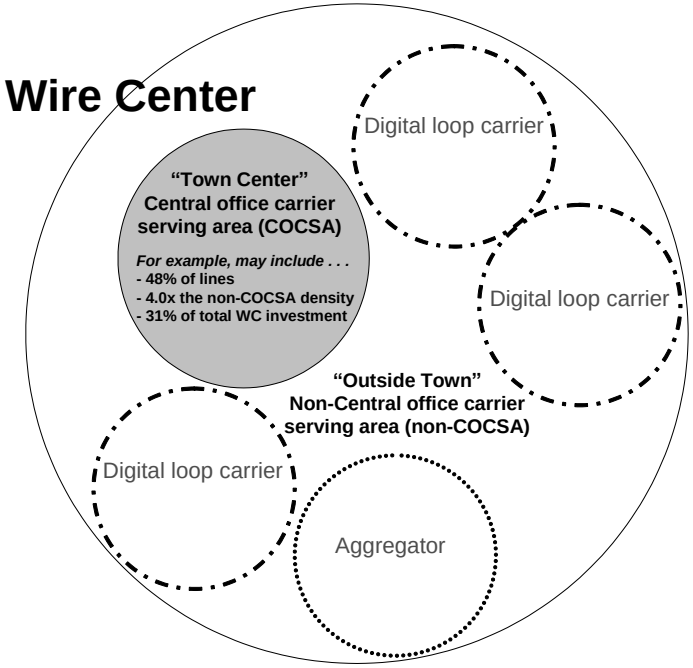
After the data were collected, they were subdivided in several ways to analyze the patterns. It became apparent early in the analysis that the costs (investment and operating) in the "Town Center," where the lines are clustered, are substantially lower than the costs Outside of Town

[9] From the outset, it is important to recognize that there are problems in specifying good data for a study such as this one. The historical investment per line is affected by often declining technology costs for some inputs offset by rising labor costs and shorter technology lives (higher depreciation) and other increased expenses such as insurance and energy. Making the analysis more complicated is the difficulty of assigning all "overhead" expenses to specific geographic serving areas. Because of the complexity in evolving technologies, regulators and companies sometimes use models and approximations to determine forward-looking cost and investment estimates. This paper uses company-generated forward-looking models that generally have proven to be effective planning tools in running these businesses to estimate investment requirements and operating data. This paper does not address the question of whether embedded (accounting) or forward-looking (economic) costs are preferable as the basis for calculating universal service support, but rather provides forward-looking data as most consistent with the Texas forward-looking support allocation method. A second caveat regarding the cost and investment data relates to which operations are to be studied. This study focuses on "supported services"—those for which USF monies are paid—excluding other services which may or may not be included in the carrier's products sold to retail and wholesale customers. Some revenues and costs associated with non-supported services are eliminated from this study to focus properly on the economics of providing core "supported services" to consumers for which USF is dedicated. Texas' approach has been to fund carriers with USF based on data drawn from wire centers rather than from study areas. The more granular approach is an important differentiator from the federal USF program. The Texas system appears superior to the federal approach as companies—telecom and other enterprises—evaluate whether to invest in operations depending on whether there is sufficient customer demand in a specific area. Texas correctly discerned that telephone companies may have some sub-study-area service areas (i.e., wire centers) where the returns on investment justify committing capital and others where there is no rational justification to operate—except a justification based on public policy. Viewed from this perspective, USF is publicly-mandated cost-recovery for providing affordable service in regions where no rational company or investor would commit capital or operations.

[10] As noted earlier, absolute figures were eliminated so that confidential information would not be compromised, but the data are verifiable and unaltered.

where lines per square mile are very few.[11] **Figure 1** is a simplified illustration of a wire center with a Town Center served by the central office switch and an Outside of Town area that is served with digital loop carriers or other remote, non-switch devices. The graphic is based on the 350,000 lines that were sampled in Texas, and summarizes a few high-level statistics. The gray portion of the wire center in the illustration is the figurative "Town Center" where about 48% of the sampled wire centers' lines are clustered, where the line density is about 4 times the density found in the "Outside of Town" region and where the modeled loop investment is only about 31% of the total wire-center loop investment. Simply represented, the investment costs are high outside of the town centers.

Figure 1: Illustration of wire center with "Town Center" area and "Outside of Town" areas[12]



Source: Balhoff & Rowe, LLC.

[11] The more technical definition of "Town Center" is the central office carrier serving area, or COCSA, where lines with lengths of 12,000 feet or less are served directly by the carrier's central office switches. The "Outside of Town" area is the non-COCSA service region, or the remaining wire center lines with lengths greater than 12,000 feet served by digital loop carriers or some other aggregator. The terms "Town Center" and "Outside of Town" are simply used here to make the description more readable.

[12] "Digital Loop Carrier" (DLC) a technology that increases the number of channels in the local loop by converting analog signals to digital and multiplexing them back to the end office. It is a basic element in the configuration of telephony "outside plant."

Excluding USF receipts, wire center returns are scarce

Policymakers are inquiring about USF—federal and state—and whether it is achieving policy goals. How much higher are the costs in rural regions compared with other regions? Where are those costs incurred? Are other technologies possibly more efficient? How can competitive goals and USF payments be reconciled?

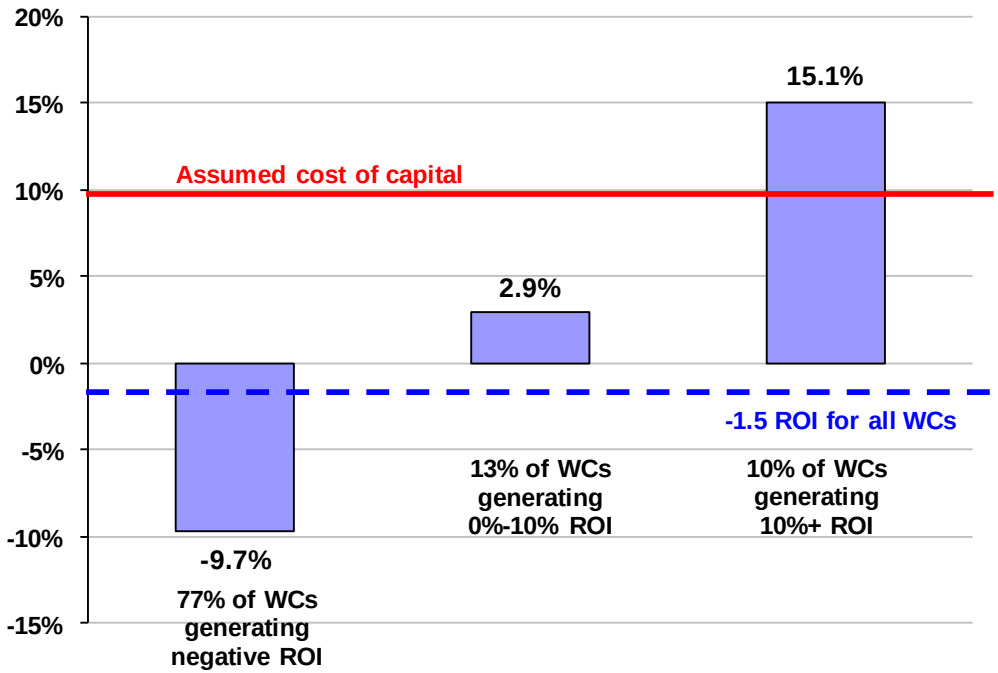
This White Paper suggests that it is possible to arrive at insightful and compelling answers, provided that the examiner starts with data. The first set of operating data examined in this section exclude receipts of universal service monies to determine whether and how much is the shortfall if *no USF monies were received.*

The financial data are operating income statement information that was divided into three groupings. All of the sampled wire centers were divided into exchanges in which the income statement and investments reflected (1) a negative return on investment, or (2) a 0%-10% return on investment, or (3) a 10%+ return on investment.[13] The 10% hurdle was chosen as a figure that approximates an historically acceptable return level and was assumed to equate to an estimated weighted average cost of capital (WACC) for this type of operation. The illustrative hurdle ROI was used to simplify the analysis and focus the findings around a threshold where a rational competitor might consider offering service or eliminating service—if there were no policy constraints.

The segregated wire center-level results, without USF revenues, are summarized in **Figure 2.** The most striking insight in the graphic is that only *10% of the wire centers in the sample are generating a return on investment that is greater than the 10% hurdle rate.* That is, 90% of the individual wire centers are generating returns below the 10% hurdle, and 77% of the wire centers are generating a negative return on investment. The wire centers generating a negative return are posting a very low average of approximately -9.7%. While the analysis does not include other revenues that are not supported by USF, it should be noted that operating expenses and investments for those non-supported revenues are also excluded in the computations.

[13] For purposes of the analyses in Part I, return on investment is calculated based on net modeled investment, that is, gross modeled investment required to provide R1/B1 "supported services" (loop, transport, and switching) reduced by an estimation of accumulated depreciation. It is believed that utilizing the net investment figure as the denominator in calculating the ROIs more closely approximates the return formulas employed by the PUC.

Figure 2: Financial Performance of All Wire Centers without USF payments



Source: Sampled Texas companies; Balhoff & Rowe, LLC.

The same data are more fully analyzed in **Table 1**. The table highlights that the wire centers generating returns above 10% are serving approximately 42% of the total 350,000 lines analyzed in this study. Further, those wire centers required only about 25% of the total "company" investment. At the other extreme is the negative return category where about 38% of the lines served in the sampled wire centers are generating an average -9.7% returns in the absence of USF support. These negative return lines compose 77% of the total wire centers in the study and require 60% of total investment. The message from these wire center-level data is clear. *Investment in 90% of the wire centers (and service to 58% of customer lines), based on "supported services," is not financially justifiable without USF support, as the returns apparently do not cover the cost of capital in the absence of USF or other services.* Because plant must be maintained, replaced, upgraded, and expanded, the analysis suggests that investment in wireline plant that is reasonably similar in quality to today's infrastructure is very costly, and is unlikely to occur without USF.

The sampled rural wire centers reveal that returns on investment in 77% of the wire centers are negative, even using forward-looking costs, without USF receipts.

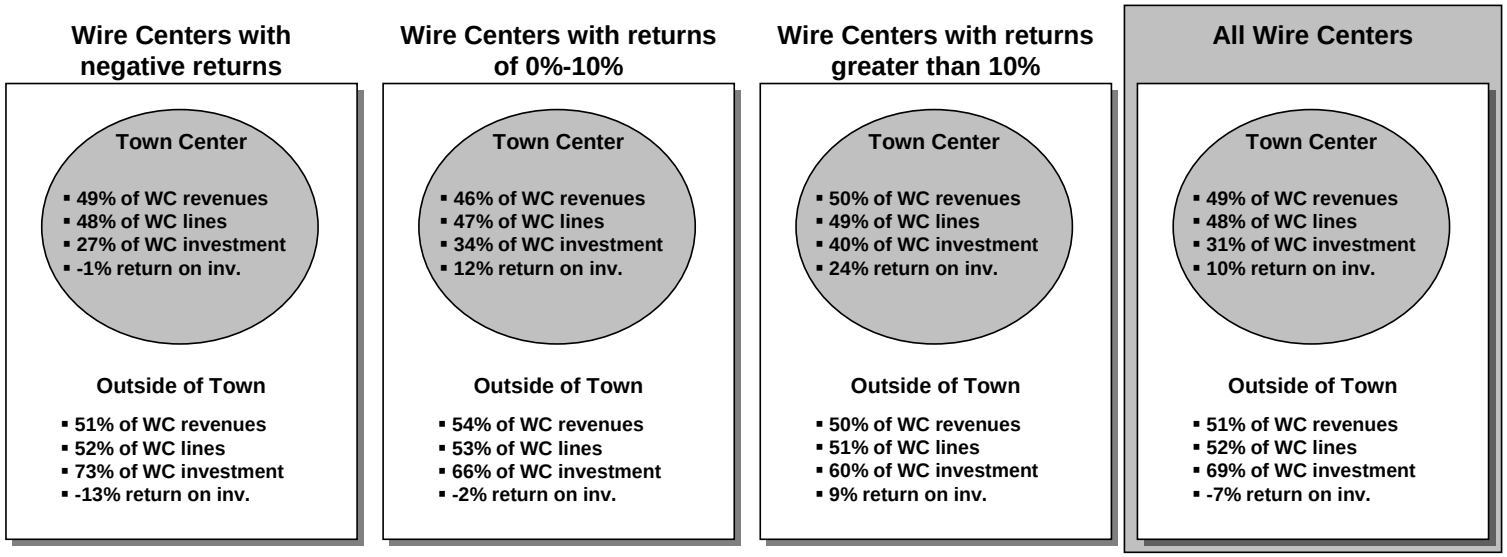
Table 1: Wire center returns on investment for supported ILEC services, *excluding USF receipts*

Wire Centers with negative returns	Wire Centers with returns of 0%-10%	Wire Centers with returns greater than 10%	All Wire Centers
38% of total lines	20% of total lines	42% of total lines	100.0% of total lines
77% of total wire centers	13% of toal wire centers	10% of total wire centers	100.0% of total wire centers
60% of total investment	15% of total investment	25% of total investment	100.0% of total investment
-9.7% return on investment	2.9% return on investment	15.1% return on investment	-1.5% return on investment

Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

The study then turned to an analysis of the financial characteristics of the wire centers, but in more detail. In this case, the authors considered sub-wire-center data, again in the absence of USF support, focusing on clustered regions and more sparsely populated outlying districts. The results of the more granular study are reflected in **Figure 3**. The illustration segregates each wire center grouping (negative returns, 0%-10%, and 10%+) into Town Center and Outside of Town regions to highlight important data and insights. For example, in the group of wire centers generating negative returns on investment, 49% of that wire-center group's revenues are generated in the denser region close to the switch (Town Center), where those lines are supported by only 27% of the total investment in those wire centers. The poorest performing sectors are predictably the Outside of Town regions. In the negative return group, returns fall from negative 1% in the Town Center to negative 13% Outside of Town. A similar disparity in returns is evident across all wire center return groups and for all of the wire centers viewed as a single group.

Figure 3: Sub-wire center returns on investment for supported ILEC services, *excluding USF receipts*



Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

The key insight is clear. A rational unregulated company *that did not receive USF monies* would analyze the various operations' financial performance and would likely decide that it should serve only the Town Center regions of those wire centers in the above 10% return grouping (24% expected ROI), as well as the Town Center regions of the wire centers generating 0%-10% returns (12% expected ROI). Thus, the carrier would choose to serve portions, but not all, of only 23% of its wire centers. It is possible that a carrier would decide for various reasons to serve the marginally economic Outside of Town region of the wire centers in the greater than 10% return group—although at a 9% ROI, serving this sub-wire center region might be disputed. In such a case, the carrier would serve all of the regions in 10% of its wire centers and a portion of another 13% of its wire centers where Town Center returns are above 10% (the 0%-10% ROI Wire Centers). Whatever the specifics (which will clearly vary from company to company), substantial portions of rural regions would go underserved or be abandoned without USF or a significant increase in revenues (generally requiring a rate increase).

A rational unregulated company that did not receive USF monies would analyze the various operations' financial performance and likely decide that it should serve only the Town Center regions of those wire centers in the above 10% return grouping (24% expected ROI), as well as the Town Center regions of the wire centers generating 0%-10% returns (12% expected ROI).

To more clearly illustrate the impact on customers, **Table 2** shows the calculation for what percentage of lines (customers) would continue to be served by an economically rational competitive carrier in the absence of USF receipts. In this analysis, the implications for rural consumers would be dramatic. Under a "bright line" test, where the carrier refused to invest in operations expected to generate returns below its 10% assumed cost of capital, only 30% of customers would continue to be served, leaving 70% unserved. Again, it is possible that a carrier would choose to continue to serve the Outside of Town region of the greater than 10% return group, adding another 21% of total lines to its new service territory. However, *at most* 51% of the total lines studied would be served by a rational service provider, leaving almost half of the existing rural customers without service.[14]

Table 2: Calculation of lines an economically rational carrier would choose to serve, *excluding USF receipts*

	Excluding USF Support			
Sub-WC Groupings:	**% of Total Lines**	**ROI**	**Served (ROI > 10%)**	**Unserved (ROI < 10%)**
Wire Centers with combined negative returns				
Town Center - sub-wire center segments	18%	-1%		18%
Outside of Town - sub-wire center segments	20%	-13%		20%
Wire Centers with combined returns of 0%-10%				
Town Center - sub-wire center segments	9%	12%	9%	
Outside of Town - sub-wire center segments	11%	-2%		11%
Wire Centers with combined returns greater than 10%				
Town Center - sub-wire center segments	21%	24%	21%	
Outside of Town - sub-wire center segments	21%	9%		21%
Total	**100%**		**30%**	**70%**

Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

Without USF, wire center data reveal that an economically rational carrier potentially could justify serving approximately 23% of its rural wire centers in whole or in part, to connect at most 51% of the rural lines and customers currently provisioned.

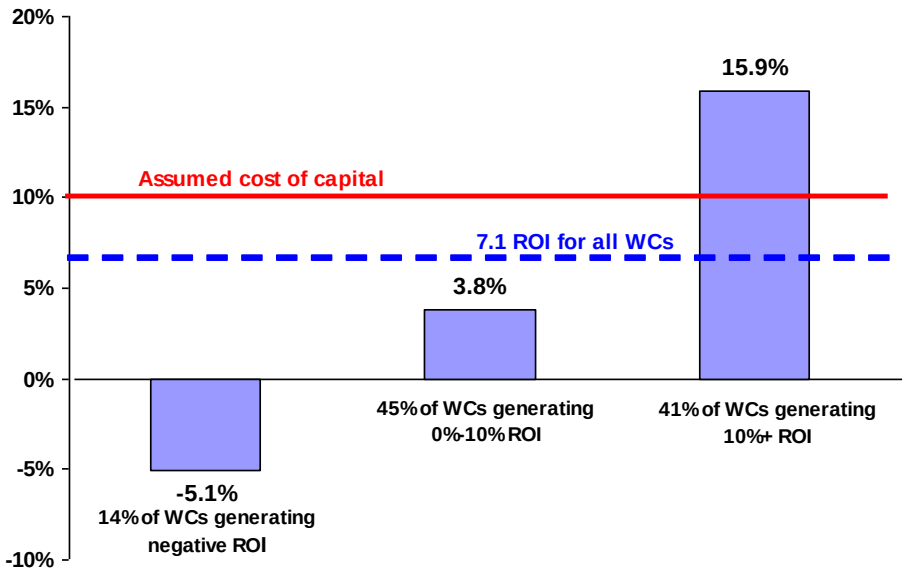
[14] The table depicts wire center data segregated into the three ROI categories described above (negative returns, 0%-10% returns, and greater 10% returns), then subdivides those wire center groupings into Town Center and Outside of Town areas (as depicted in Figure 3). Thus, of the wire centers with negative returns, the Town Center ROI is -1% and the Outside of Town ROI is -13%; in the same way, of the wire centers generating 0%-10% returns, the Town Center region is generating ROIs at 12%, but the average is affected by the Outside of Town regions which are generating an average -2%. The first column indicates the percentage of total lines represented in each sub-wire center segment. The final two columns simply calculate whether or not the lines in the specific sub-wire center segments would be served by an economically rational service provider with a 10% cost of capital – if the sub-wire center segment returns are greater than 10%, the lines would be "Served" and if the sub-wire center segment returns are less than 10%, the lines would be "Unserved." For example, in the wire center group with combined returns greater than 10%, the Town Center sub-wire center segment generates a 24% ROI, so the 21% of total lines composing this segment would be Served by an economically rational carrier. Conversely, the Outside of Town sub-wire center segment in the same wire center group generates only a 9% ROI, so the 21% of total lines composing this segment arguably would be unserved by an economically rational carrier with a 10% cost of capital.

There are other interesting data in these analyses of wire center and sub-wire center financial performance. However, the foundational message is strong. Universal service monies are necessary, in this sampling, for the vast majority of the switching centers and for approximately half the lines. Without USF, unless some alternative technology is developed, supported and deployed, an unacceptable number of customers would go without access to even basic "supported services." While some critics point to the alternatives of wireless service or cable television plant, those networks are not ubiquitously carrier-class and are not pervasively reliable in the regions highlighted in the section above.

Including USF receipts, wire center returns are improved, but highly concentrated

Using the information drawn from Texas rural telecommunications operations, the financial data were further analyzed to determine returns on investment[15] *when actual USF receipts are included.* **Figure 4** illustrates the three segregations of wire centers, but this time *including* USF. In this case, more wire centers generate positive returns because the financial metrics *include USF receipts*. Certain wire centers in **Table 1** presented on page 17 have improved and moved to higher return categories because of the inclusion of USF receipts.

Figure 4: Financial performance of all wire centers with USF payments



Source: Sampled Texas companies; Balhoff & Rowe, LLC.

[15] These are returns on *net* modeled investment, after estimated accumulated depreciation.

When USF support is added to the financial profile, instead of only 10% of the wire centers in the group generating economically acceptable ROIs, the graphic illustrates that 41% of the wire centers generate a return above 10%. Still, because of the averaging effects and the requirements of ubiquitous service, 59% of the wire centers continue to generate uneconomic returns (less than the assumed 10% cost of capital). The total return across all wire centers, based on "supported services" alone, is a modest 7%. In this case, the ROI is financially inadequate if one assumes that 10% is the appropriate return on investment.

Table 3 summarizes the more detailed wire center data when USF receipts are included. Again, the analysis is segregated into wire centers that generate negative returns on investment, those that generate 0%-10% returns, and those with returns greater than 10%. The table adds an insight that is stunning. *With USF receipts,* approximately 41% of the total wire centers and 55% of the total lines generate *112%* ***of the total net profit*** within the sampled group. The reason for the over-100% contribution is that 14% of the wire centers, which include 12% of the total lines, are generating ***a negative 25% of the total net profit***. Another way of looking at these data is to note that, *even with USF receipts,* 59% of the total wire centers and 45% of the total lines are generating *a low or* ***negative net profit***, and consequently unacceptable returns on debt and equity capital invested. In part, this analysis highlights the risk in a system that averages USF payments based on study areas or on exchanges, but that point will be further developed later in this report.

Table 3: Wire center returns on investment for supported ILEC services, *including USF receipts*

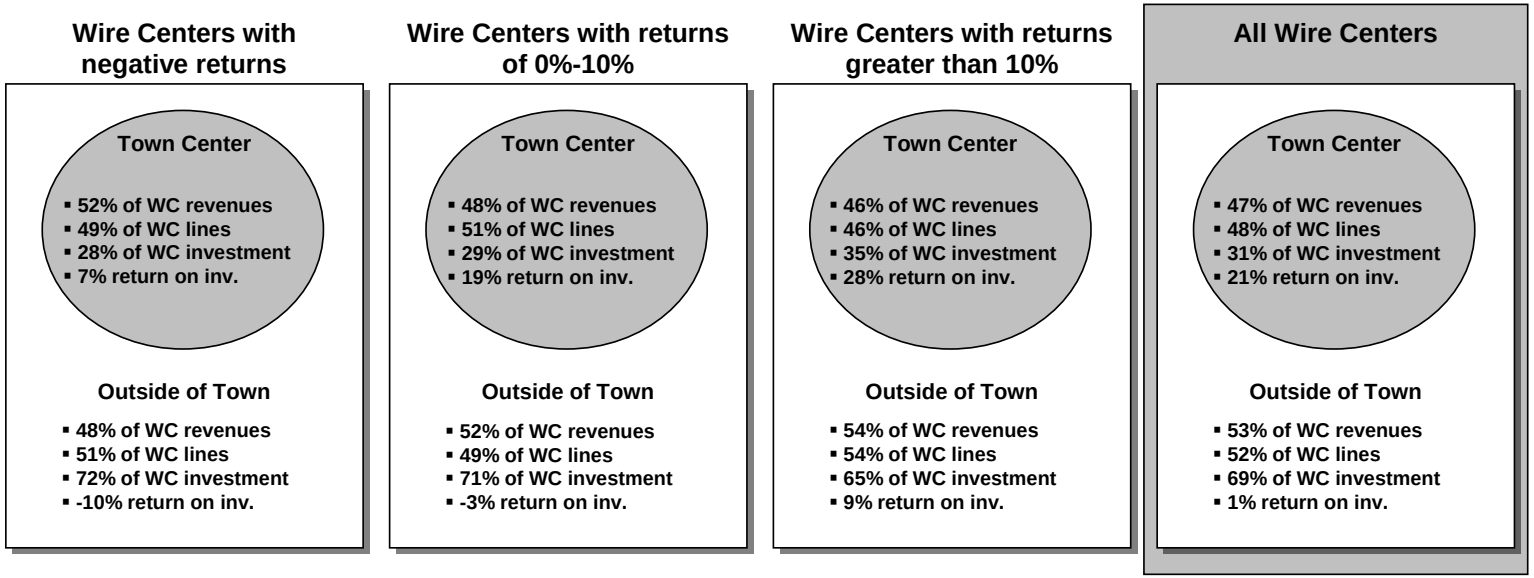
Wire Centers with negative returns	Wire Centers with returns of 0%-10%	Wire Centers with returns greater than 10%	All Wire Centers
-25% of total net profit	13% of total net profit	112% of total net profit	100% of total net profit
12% of total lines	33% of total lines	55% of total lines	100.0% of total lines
14% of total wire centers	45% of total wire centers	41% of total wire centers	100% of total wire centers
18% of total investment	41% of total investment	41% of total investment	100% of total investment
-5% return on investment	4% return on investment	16% return on investment	7% return on investment

Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

While the data are disturbing, the financial performance and implications become even more troublesome when one observes what is occurring in the sub-wire-center regions. Town Center versus the Outside of Town areas are depicted in **Figure 5**. The Town Center areas in all wire center groupings generate positive returns on investment, ranging from 7% at the low end to 28% at the high end. The blended Town Center ROI in all wire centers is 21%, compared with the total return for all wire centers of 7% on "supported services." In stark contrast, the Outside of Town regions in 59% of the wire centers generate negative returns and the ROI for the Outside of Town regions in the best performing wire center grouping remains at 9%, which is slightly below the assumed cost of capital. Combined, the Outside of Town regions for all wire centers studied, *including USF receipts*, generate a weak 1% return on invested capital. Therefore, while the inclusion of USF monies clearly improves the financial health of the rural wire centers, the concentration of economic profits and returns on investment in the more densely populated Town Center areas could hardly be more dramatically illustrated.

The Outside of Town regions in 59% of the wire centers generate negative returns and the ROI for the sparsely-populated regions in the best performing wire center grouping remains at 9%, which is slightly below the assumed cost of capital.

Figure 5: Sub-wire center returns on investment for supported ILEC services, *including USF receipts*



Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

The financial import is clear. A *rational competitive company seriously will consider eliminating or avoiding service to the properties that do not provide a return above the cost of capital*, which can be represented as something near or above 10% for typical rural telephone companies. To reiterate, **Table 3** suggests that *even with USF receipts* it is appropriate/reasonable to provide "supported services" (unless there is some other offsetting source of profitability) to only about 41% of the total wire centers, which are those wire centers generating in excess of 10% return on investment. However, the sub-wire center detail indicates that an economically rational carrier might serve a slightly different, more concentrated set of lines/customers if presented with that opportunity.

Even with USF receipts, it is appropriate to provide "supported services" (unless there is some other offsetting source of profitability) to only about 41% of the total wire centers.

Table 4 below illustrates that only 42% of the total lines included in the Town Center regions are generating a return above 10%.[16] This more granular analysis suggests that, if the carrier were also to retain the marginally economic Outside of Town lines in the top-performing grouping, the total lines served would be *at most* 72% of the total sample. The dilemma is apparent, as an economically rational carrier facing increasing competition and meaningful capital allocation decisions is compelled to consider discontinuing the provision of "supported services" (based on anticipated ROIs) to almost 30% of its existing customers. All of this analysis presumes that there are no policy constraints imposed on the carrier and that the carrier can respond in an economically rational manner, and that USF monies can be paid to a more concentrated service area. At the present, the policy requires that the incumbent cannot selectively serve customers in its region. It is not true, however, that the competitors are required to assume the same obligations to receive USF monies, raising the disturbing question of whether there is true competitive neutrality in such a scenario.

Table 4: Calculation of lines an economically rational carrier would choose to serve, *including USF receipts*

	Including USF Support			
Sub-WC Groupings:	**% of Total Lines**	**ROI**	**Served (ROI > 10%)**	**Unserved (ROI < 10%)**
Wire Centers with combined negative returns				
Town Center - sub-wire center segments	6%	7%		6%
Outside of Town - sub-wire center segments	6%	-10%		6%
Wire Centers with combined returns of 0%-10%				
Town Center - sub-wire center segments	17%	19%	17%	
Outside of Town - sub-wire center segments	16%	-3%		16%
Wire Centers with combined returns greater than 10%				
Town Center - sub-wire center segments	25%	28%	25%	
Outside of Town - sub-wire center segments	30%	9%		30%
Total	**100%**		**42%**	**58%**

Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

To summarize this initial section, the data tell a relatively compelling story. *The analyses regarding the financial characteristics of rural service, both with and without USF, highlight at least three important points. First, USF appears to be demonstrably necessary to support the provision of affordable service in sparsely-populated, primarily Outside of Town regions. Second, the current USF receipts appear to be approximately right-sized when averaged across these carriers' regions today, although this study indicates a potential need for additional support given that the 7% ROI for all wire centers including USF receipts remains below the assumed cost of capital hurdle. Third, if the carriers were to lose a meaningful percentage of their economically sound Town Center subscriber base, the consolidated return figures could turn sharply negative. If there is a fourth point, it is that the averaging effect of current USF*

[16] Again, this table is similar to **Table 2** on page 18. The wire centers are divided first into the three primary ROI-based groupings and then are further divided into Town Center and Outside of Town sub-wire center segments. To provide an additional example of how the table should be read, of the wire centers that are generating 0%-10% returns, the Town Center segments are generating a 19% ROI whereas the Outside of Town segments generate a -3% ROI. Therefore, the 17% of total lines composing the Town Center segments in the 0%-10% grouping would be Served by an economically rational carrier with a 10% cost of capital (ROI exceeds the cost of capital), while the 16% of lines composing the Outside of Town segments in the 0%-10% grouping would go Unserved (ROI substantially below the cost of capital).

payment methodologies might create anticompetitive patterns and distortive effects. ***Part II*** *of this report explores this concept further in light of the emerging competitive investments.*

Texas data—magnitudes of different investment costs in rural regions

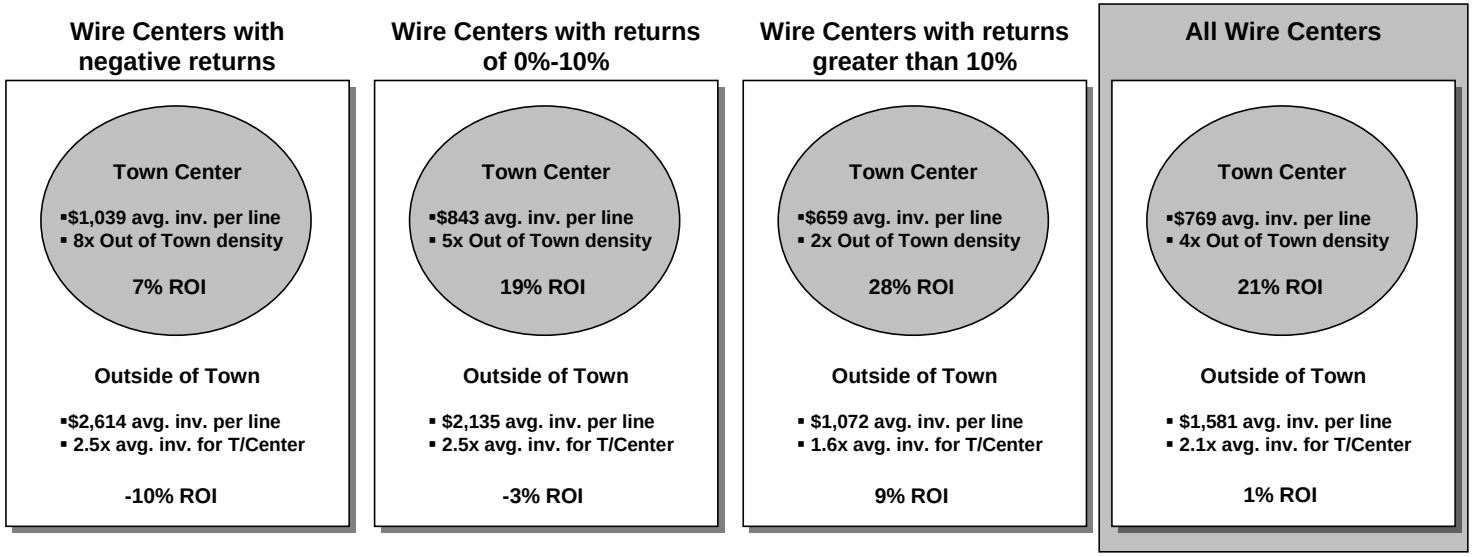
The data about returns on investment presented .in the previous sections reflect the higher operating and investment costs in rural regions for a high fixed-cost business. So the reader can gain a greater sense of the magnitude and sub-wire center disparities of investment in high-cost regions, **Part I** concludes with a brief summary of relative capital investment costs and density statistics. Those data are illustrated in **Figure 6**. The graphic depicts the ROI-based sub-wire center groupings *including USF receipts*, and illustrates average per line investment (on a net basis). There are interesting insights in the illustration such as the relative line density in Town Centers versus Out of Town regions, and the disproportionately high investment required Outside of Town versus in Town Centers. Notably, outside the Town Center, the investment costs range from about 1.6x-2.5x higher than the level required to provide service close to the switch where population density is higher. In each wire center grouping, the economic calculus is clear—Town Center population density (lines per square mile) is at least 2x, and is on average 4x, the density found Outside of Town. Correspondingly, average investment per line in the towns is a fraction of the per-line investment required in the Outside of Town areas. The result is a predictable one. ROIs steadily increase as required per-line investment declines across the various return groupings and sub-wire center regions. The consolidated figures for "All Wire Centers" illustrate the intuitive, yet revealing, story. Town Center line density results in per-line investment that is 51% lower and returns that are twenty percentage points higher than those found Outside Town.

The economic calculus is clear: Town Center population density (lines per square mile) is at least 2x, and is on average 4x, the density found Outside of Town for each wire-center grouping. Outside of Town costs are multiples of Town Center costs.

Importantly, **Part II** will highlight that the return levels in the Town Center areas are likely unsustainable, as competition is already or will soon be attracted to enter these profit centers. The predictable result of targeted competitive entry is a reduction in overall profitability for incumbent carriers, making incumbent rural operations even less economically attractive.[17]

[17] Recall that, in total, the consolidated ROI for the studied rural wire centers is only 7%, including current USF receipts; and this return is below the assumed cost of capital hurdle.

Figure 6: Investment costs and density by wire center return groupings, *including USF receipts*



Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

Summary comments

The Texas PUC is seeking insight into the importance of Universal Service funding to determine whether the allocated monies are accomplishing their goals. This initial section notes that the PUC's rates and service metrics provide an initial indication that customers are being well-served at reasonable rates. Further, this section compiles additional information to demonstrate that, *without USF support*, an economically rational competitive carrier might reasonably choose to be selective or discontinue provision of "supported services" to as many as 70% of its existing customers in rural regions that are characterized by low-density and long loop lengths. In addition, **Part I** presented data regarding the economics of service to rural regions when current USF receipts are included in the financial equation. While profitability and returns clearly improve when USF receipts are added, the opportunity for economic returns remains concentrated in the more densely populated, lower cost-to-serve Town Center areas. The data in this study indicate that, *even with USF*, the economically rational carrier might still reduce or eliminate service to 58% of its rural customer base, if allowed to do so by regulators. Because investment costs are such a large percentage of the expense in serving rural regions, the costs can rise to levels that would require high rates that a rural consumer cannot be expected to pay. Based on these analyses and apparent economic realities, universal service support appears to be an important and necessary element in ensuring that affordable rural communications reach many consumers.

Based on these analyses and economic realities, universal service support is an important and necessary element in ensuring that affordable rural communications reach many consumers.

Part II: Competitive Trends in Rural Regions – Targeting Profits

An important element of the Texas inquiry is to understand the *relationship between competition and universal service*. **Part I** affirmed the need for continuing USF support to achieve the policy goals of widely available and affordable basic telephony service. Competition is also a fundamental policy goal, as the PUC declared that its universal service mechanisms were to serve as a transition to a competitive marketplace.[18] This section of the White Paper asks how emerging competition in various regions affects the state's universal service commitment. Important questions are: (i) is there competition in rural areas and is it expected to continue or grow; (ii) are the competitive new entrants providing ubiquitous or limited service; and (iii) do emerging competitive patterns alter the need to fund some or all universal service in certain regions? The major messages in **Part II** are the following.

- **Competition is emerging even in rural communities, and line losses in overbuilt rural regions, concentrated in Town Centers, have risen to 50%–60% in certain overbuilt exchanges over the last five years.** A sampling of 25 rural exchanges serving over 30,000 lines where there is facilities-based telecommunications competition reveals meaningful competitive customer losses even in rural regions. With a combined line loss of 27% over the 5-year period and a negative six percent Compound Annual Growth Rate (CAGR), line losses are material for rural incumbent carriers with the losses concentrated in Town Centers.
- **Competitive activity is developing in denser, less capital-intensive rural regions, but is not likely to occur in the highest-cost low-density regions.** Competition from facilities-based wireline competitors is concentrated in Town Centers. Notably, cable-based competition appears poised to unfold in more populated regions, generally where telephone companies are serving clustered populations (i.e., similar to the Town Center areas identified in **Part I**). Cable-served rural areas are approximately 31x denser (lines per square mile) than non-cable served rural areas. In the studied rural geographies, cable operators were providing service in regions where per line investment appears to be only 44% of the per line investment required in non-cable-served regions.
- **Competition and resultant line loss in denser core areas are likely to drive up the de-averaged costs in outlying rural regions.** The incumbent telephone operator, which continues to be obligated to serve *all* customers in a wire center, is likely to face margin-compressing competition that creates more serious financial pressures on service to uneconomic, low-density areas. Notably, competition is occurring only in Town Centers, so the combination of losses in those regions with the ongoing obligation Outside of Town creates a serious risk. The exchanges in this White Paper reported modeled per line network investment and operating costs in areas outside of the cluster that were almost 4x the total (averaged) wire center costs. Further, if the network were built to serve only the areas outside of the cluster, investment and operating costs would be about 15x higher than the costs needed to build a network to serve only the Town Center. *Far from eliminating the need for USF support, the form of targeted competition evidenced in the data actually exacerbates the financial need for explicit high-cost support* of Outside of Town areas as internal cross-subsidies fail.
- **Cable operators are poised to capture significant market share in Town Centers in the near term, further pressuring carriers that serve customers in Outside of Town areas.** National data suggest that rural towns will be fertile for cable telephony competition, with line losses for incumbents in the first year possibly at 10%–15%, and incremental losses rising to as much as 20% within about two years. These line losses are not likely to occur in uneconomic outlying regions, as geo-coded data suggest that cable service is concentrated in towns rather than in outlying regions, as would be expected of a rational business operating without POLR obligations.

[18] *See* Texas P.U.C. Final Order, II Docket 18515.

Reports from all parts of the U.S. indicate that there are shrinking numbers of access lines and that intermodal competition—wireless and cable broadband—is expanding even in rural regions. **Part II** of this White Paper will demonstrate that competition is in fact occurring, albeit selectively, in rural regions. This section will highlight that the competitors in rural areas are focusing their operations to serve the towns and population clusters (i.e., areas similar to the Town Centers profiled in **Part I**). There appears to be very little competitive infrastructure—except what is supported by the POLR—serving customers outside of Town Centers because the capital and operating costs are disproportionately high in outlying regions. While cable companies or wireless operators will not necessarily have the same costs as those of a telephony operator,[19] the cable operators' costs of serving Outside of Town rural areas are likely to be proportionately higher by multiples that are similar to those of the telephone companies. Therefore, given the concentration of profit and return potential in the Town Centers, the pattern of targeted competition is both rational and predictable.

Is there meaningful facilities-based competition in Texas rural regions?

Based on the data reviewed, wireline competition is occurring in rural areas in Texas, with absolute line losses often, but not always, more severe in larger exchanges rather than smaller. While there are insufficient data about wireless providers in rural regions, important insights can be gained concerning wireline competitors. In all of the smallest exchanges where line loss has been high, the payments of Texas universal service support are very high, averaging nearly $58 per line per month. Importantly, those line losses are concentrated in the community and do not appear to be serving customers in the highest-cost portions of those exchanges.

The competitive analyses in this section are based on several sources. The first analysis was generated using data from 25 Texas rural exchanges[20] serving over 30,000 lines. In these exchanges, there is another facilities-based telecom provider (not a cable operator), which was most often another local exchange company serving an adjacent geographic region. Each of the overbuilt 25 rural exchanges were studied to determine the trends related to line losses and to discern any other competitive patterns.

The data indicate that, in the 25 rural Texas exchanges that were studied, the competitive losses have been surprisingly high. **Table 5** details the annual line losses, segregating the data by the size of the wire center and by residential versus business lines. Several insights are notable. First, the smaller overbuilt exchanges in the Texas competitive study have been hit harder than the larger exchanges on a percentage line loss basis. The larger exchanges appear to have attracted competitors because of the size of the exchanges, while the concentrated losses in small exchanges may be explained by the opportunity to acquire USF payments. Second, the fifteen smallest exchanges and sixth, seventh and eighth largest exchanges all receive Texas Universal Service support for which the average monthly per line support in those exchanges is $57.68. The smaller exchanges present the chance to selectively capture USF monies concentrated in more clustered communities and to omit service to outlying regions (virtually no competitive service is provided in outlying areas). Third, the total line losses were a combined 27% loss over the 5-year period with a -6% CAGR. The total market share losses were larger than one might have assumed in rural regions, except when viewed in terms of the concentrated service territories and the potential to drain off USF and access payments. And, fourth, there appears to have been a slowing of the line losses in most of the wire center groups in 2005, likely because the competitive facilities provider is reaching some level of competitive balance. However, the authors believe that cable VoIP offerings, which will be explored in more detail

[19] The incumbent telephone companies must meet certain state-defined quality and service standards, which will almost certainly drive costs higher than those of other non-regulated companies, but it is believed that most of those costs are a function of policy-mandated factors. Further, while other competitors may have lower absolute costs in terms of infrastructure and operating costs—again significantly because of differing regulatory obligations—it is assumed that wired "loop-like" investment and maintenance will be affected by labor and other costs that create disparities between Town Center clusters and Outside of Town densities.

[20] Some of the studied exchanges currently receive USF support, while others do not.

later in this section, could provide a catalyst for a re-acceleration of losses (again, losses studied here were inflicted by other telephone companies that overbuilt certain exchanges). One of the most important insights, however, is not captured in this table, which is that the losses were virtually all occurring within the clustered parts of the exchange—the so-called core regions which are effectively "Town Centers." An inconsequential number of lines were lost outside the core—because the competitors do not build outside the central core. This last point will be explored more fully later in this section.

Table 5: Annual line losses in surveyed 25 competitive rural exchanges

	Year-over-Year Growth Rates					Total Change	
	2001	2002	2003	2004	2005	%	CAGR
Exchanges w/ > 5,000 Lines							
Business Access Lines	5.8%	-7.1%	-6.4%	-3.5%	-1.5%	-12.5%	-2.6%
Residential Access Lines	-3.8%	-5.6%	-7.3%	-7.8%	3.3%	-19.8%	-4.3%
Total Access Lines	**-1.1%**	**-6.1%**	**-7.0%**	**-6.5%**	**1.8%**	**-17.8%**	**-3.8%**
Exchanges w/ 1,000 - 5,000 Lines							
Business Access Lines	0.1%	-0.5%	-5.7%	-7.0%	-5.3%	-17.2%	-3.7%
Residential Access Lines	-8.7%	-12.9%	-8.9%	-14.5%	-1.7%	-39.1%	-9.4%
Total Access Lines	**-6.2%**	**-9.2%**	**-7.9%**	**-12.0%**	**-3.0%**	**-33.1%**	**-7.7%**
Exchanges w/ 500 - 1,000 Lines							
Business Access Lines	-2.7%	-2.3%	-7.0%	-4.6%	-12.9%	-26.5%	-6.0%
Residential Access Lines	-9.4%	-3.3%	-8.9%	-14.4%	-14.4%	-41.6%	-10.2%
Total Access Lines	**-7.5%**	**-3.0%**	**-8.4%**	**-11.5%**	**-13.9%**	**-37.4%**	**-8.9%**
Exchanges w/ < 500 Lines							
Business Access Lines	-11.8%	-10.8%	-5.6%	-8.5%	-7.2%	-37.0%	-8.8%
Residential Access Lines	-28.7%	-13.9%	-17.0%	-19.3%	3.2%	-57.6%	-15.8%
Total Access Lines	**-23.8%**	**-12.9%**	**-13.1%**	**-15.3%**	**-1.0%**	**-51.7%**	**-13.5%**
Total Exchanges Studied	**-4.6%**	**-7.2%**	**-7.7%**	**-9.1%**	**-1.3%**	**-26.7%**	**-6.0%**

Source: Representative confidential Texas LEC data and Balhoff & Rowe, LLC.

The data suggest answers to several foundational questions regarding competition in rural areas:

(i) competition is occurring in some rural regions and has been for quite some time;

(ii) while other rural regions may not yet be experiencing competition, there is every reason to project that the denser regions can and will have competition; and

(iii) the impact of the competition on rural incumbent carriers is significant.

While it should be noted that this analysis does not serve as a comprehensive survey of competition and competitive impacts in rural Texas, the authors believe that the results are directionally indicative of the fact that there is ongoing meaningful facilities-based competition in at least some rural regions, which is a positive indicator for policy-based competitive policy.

The data answer several foundational questions regarding competition in rural areas: (i) competition is occurring in some rural regions and has been for quite some time, (ii) while other rural regions may not yet be experiencing competition, there is reason to believe that additional denser regions can and will have competition, and (iii) the impact of this competition on rural incumbent carriers is significant.

Cable Voice over Internet Protocol (VoIP) – a powerful threat

Telephone companies have overbuilt various rural regions around the country and in Texas, but CLEC activity may prove slow for some regions. However, most observers believe that cable telephony is growing to be the most formidable competitive communications service in urban and rural areas. The cable operators have the benefit of already-existing access plant, high throughput speeds for data, revenues from video products, little regulation, the freedom to build their networks where the economics make sense, and low incremental telephony costs. Bundled service offerings, diverse revenue streams and regulatory freedom make cable operators a very powerful threat—even if, in some or many instances, the CATV telephony product is not as reliable or as high-quality as traditional regulated telephony. Before reviewing the Texas-specific data, it is helpful to consider certain national data about the adoption of VoIP products, which are offered over the cable plant and over "naked-DSL."[21]

Insights into VoIP penetration rates across the U.S.

Voice over Internet Protocol is changing consumer behavior and challenging long-standing regulatory regimes. And the changes affecting consumers and policies appear to be unfolding rapidly.

Recent reports from financial analysts highlight the remarkably rapid shift toward broadband services, and toward the use of VoIP services.

Recent reports from financial analysts highlight the remarkable shift toward broadband services and toward the use of VoIP services.[22] However, the nationwide statistics for VoIP substitution for telephony services actually understate the pace of change, since they reflect an averaged rolling introduction of VoIP in multiple markets.[23] The more telling perspective, according to analysts, is gained by focusing on the

[21] "Naked DSL" is a local loop without voice telephony or the associated dial tone.
[22] *See* Bernstein Research, *Broadband Update: Seasonality Remains a Question But Growth Continues Unabated; The Fight Turns to Net Additions*, July 7, 2006; "As of the end of the first quarter, over 61% of Internet subscribers are now using broadband connections. This represents an over 1,100 bp increase since the first quarter of 2005, and 300bps sequentially from 4Q05. While quarterly subscriber rates of change are seasonal and therefore less telling than annual rates of change, it is notable that the 300bp increase in broadband market share since 4Q04 is the second highest sequential growth in broadband market share over the past four years."
[23] Banc of America Securities, *Battle for the Bundle,* June 14, 2005; "Although on a consolidated basis, . . . penetration has ramped up in a relatively linear way . . . we believe this reflects the continued footprint expansion"; p. 4.

penetration figures of cable operators in the specific markets that the cable companies have targeted. When analyzing individual markets, VoIP services are capturing share at a stunning rate, generally controlling more than 10% share of cable homes passed in the first year of marketing.[24] Analysts point to the consistent rapid double-digit first-year market share gains of Cox (circuit-switched telephony) in Orange County and Time Warner (VoIP) in Portland, Maine.[25] Most analysts also cite Cablevision's New York VoIP rollout that appears to provide additional data that generate a market-specific pattern. Banc of America notes that, in New York, Cablevision's VoIP rollout achieved nearly 11% penetration of cable homes passed in the first four quarters (one year) of concentrated marketing.[26] Some analysts expect that Time Warner and now Comcast will follow penetration trajectories similar to that of Cablevision. One analyst wrote recently that "Although it is still early to extrapolate, Comcast's results appear to mirror the initial results at Cablevision and Time Warner. During 1Q06, Comcast [achieved] a virtually identical rise to that seen at Cablevision during the second quarter of their VoIP launch in early 2004."[27] The analyst notes that Cablevision achieved more than 19% penetration of homes passed in a period that represented about two years of marketing. The concentrated market increases posted by Cablevision are summarized in **Figure 7**, which also includes the final quarters of 2003 before Cablevision began its marketing push through the end of 2006.

Is this merely a matter of urban or suburban VoIP growth? It appears that the urban statistics are consistent with, but slightly lower than, those reported to the New York Public Service Commission regarding rural markets, where first-year cable-sponsored VoIP penetration in one of Alltel's (now Windstream) rural service areas was possibly as high as 16%.[28]

[24] Id., "Market-by-market data actually implies that the ramp up is very rapid and then reaches a plateau. . . early Cox data from Orange County shows that market share climbed to about 25% in most nodes within two years"; pp. 4-5.

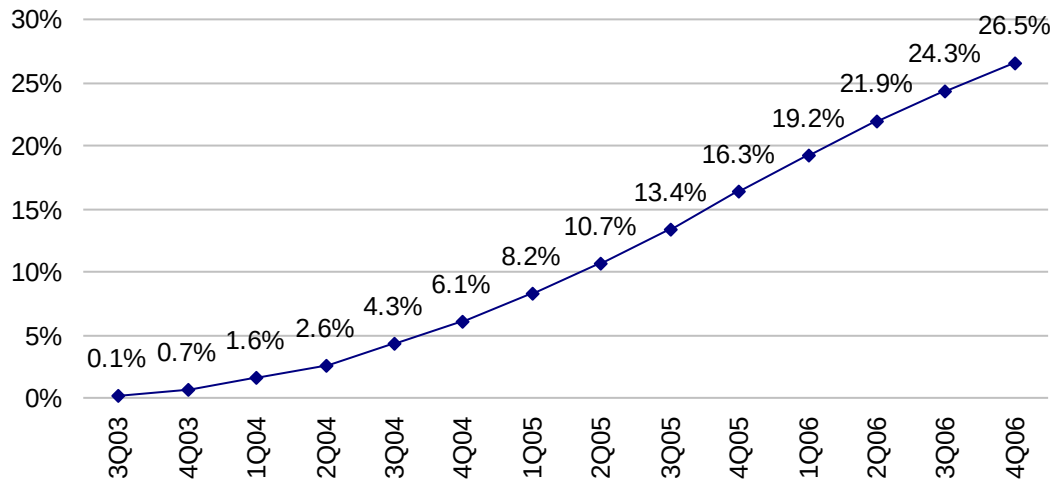
[25] Anna Carugati, *Interview with Time Warner's Richard Parsons,* WorldScreen, October 2004, available at http://www.worldscreen.com/print.php?filename=1004parsons.htm; Parsons: "We spent the last year in one of our markets, which is in Portland, Maine, deploying this product. In about a year, 13 percent of the homes passed have actually taken the product. Approximately 40 percent of the people who have the Road Runner high-speed service have taken the product, and a majority of them have made it their primary wire line."

[26] *See* Banc of America Securities, *Cablevision Corporation: VoIP Halo Effect in Full Effect; No Update on Bid*, August 9, 2005; "In just four quarters of concerted marketing [Cablevision] is now at 31% penetration of the data sub base and almost 11% penetration of total passings. Management also noted on the call that bundling improves churn by about 18%", p. 3.

[27] Bernstein Research, *Quarterly VoIP Monitor: Six Million and Counting*, June 12, 2006, p. 5.

[28] *See* Reply Comments of the New York State Telecommunications Association, Inc. and Balhoff & Rowe, LLC, *Proceeding on Motion of the Commission to Examine Issues Related to the Transition to Intermodal Competition in the Provision of Telecommunications Service, Case 05-C-0616; October 28, 2005;* "The VoIP threat, even in smaller exchanges, appears to be significant. ALLTEL reports that one of its small communities lost 1,243 lines (15.8%) in the first 10 months of 2005 out of 7,866 total lines at the end of 2004. Of those lost lines, 614 customers indicated in exit polls that they were switching to VoIP. Using that figure, the annualized loss to VoIP alone was 9% ((614 lost lines / 7866 total 2004 lines) / (10 months / 12 months) = 9.4%). Importantly, we assume that not all the customers that were switching to VoIP disclosed their intentions so that the figure is at least 9% and is likely higher, and we believe that the unaccounted-for 10% shift (the total annualized loss was 19.0%) that is unexplained is extraordinarily high. As a result, we believe that ALLTEL's experience with VoIP suggests that approximately 10%–16% annualized share loss occurred because of VoIP in the initial period (assuming that 3% line loss is the more expected non-VoIP decline in lines)."

Figure 7: Cablevision VoIP quarterly penetration of homes passed

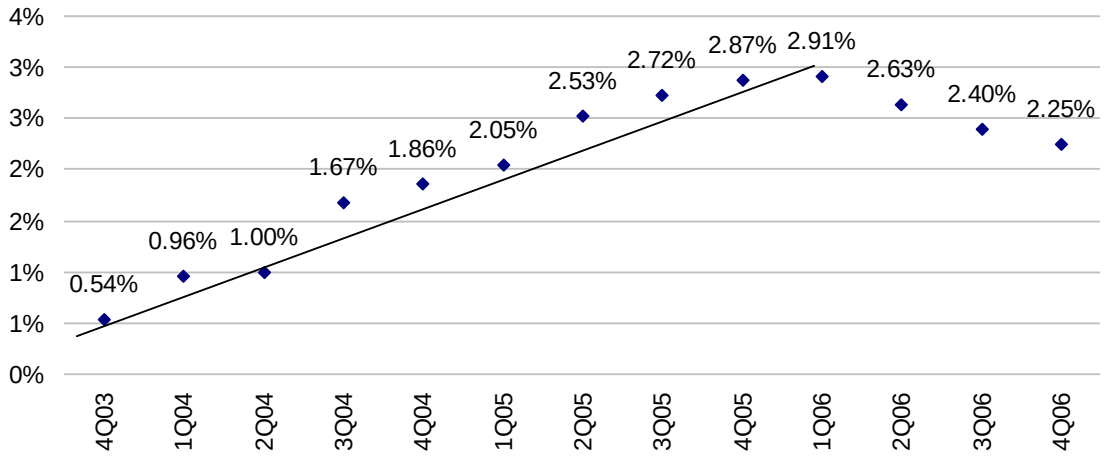


Source: Cablevision financial reports; Balhoff & Rowe, LLC.

Further emphasizing the pace of change is a related set of statistics from Bernstein. **Figure 8** is a re-creation of and the extension of a chart from Bernstein Research. It depicts the incremental change *each quarter* for Cablevision's New York VoIP market share. The amazing message in this illustration is that the *incremental change* in market share is higher each quarter from the time of rollout through the end of the second year of service. Thus, the pace of market share gain was not only high, but was *accelerating* through the first 10 quarters, with cable VoIP capturing at that high point an incremental 3% of homes passed—not annually—but quarterly. Put in other terms that are possibly more stunning, the Cablevision subscriber growth from the fourth quarter of 2005 to the first quarter of 2006 was 18%—again, not year-over-year, but *in a single quarter*. The pace has slowed in the last several quarters, but in the fourth quarter of 2006, the pace of growth from the third quarter to the fourth quarter was still 10%. If, as analysts are suggesting, the pattern in the markets of Time Warner and Comcast are mirroring this pace, then the losses of telephony customers by incumbent carriers *in individually-targeted cable-served regions* are likely to be very high and may very well re-write the operating and regulatory landscape of telecommunications. The message is clear that the cable-served locales—for residential and small business services—are becoming, or are poised to become, very competitive virtually overnight.

The amazing message in this illustration is that the incremental change in market share is higher each quarter from the time of rollout. Thus, the pace of cable IP market share gain is not only high, but has been accelerating.

Figure 8: Cablevision: incremental quarterly change in VoIP penetration of homes passed



Source: Cablevision financial reports; Balhoff & Rowe, LLC..

Analysis of Texas geo-coded cable service regions - where are cable companies *choosing* to compete?

If telephony services in cable-served regions are becoming rapidly more competitive as a result of the introduction of VoIP or other facilities-based competition, what does this mean for the Texas consumer, for the companies charged with providing carrier of last resort networks, and for policymakers who authorize payments of USF? *The answer is that consumers likely will have the option to subscribe to competitive, high-bandwidth services even in denser, rural service regions and will benefit from lower prices. However, the companies that offer provider-of-last-resort services will increasingly experience financial problems as they continue to be the sole providers in uneconomic regions while they are losing share or having to match lower prices in the more economically attractive population clusters. Competitors are now targeting, and will continue to target, selective rural populations, putting at risk a system based on averaged USF payments across larger rural regions. This insight confirms the approach Texas adopted in targeting support to the wire center level, but the system will apparently have to be even more specific to accommodate financial realities.*

To begin the analysis, **Table 6** provides summary insights into data about the characteristics of the regions served by cable operators and the regions in which they do not provide service.[29] The data in the table highlight that cable operators tend to serve clustered regions (those with

[29] To determine what wire centers are affected by cable competition, the study used a combination of telephone company internal geographic data and a MapInfo product called MediaPrints. As described by MapInfo, "*MediaPrints™ is a comprehensive, industry-standard cable data set that includes more than 10,000 U.S. cable systems. Designed for use with MapInfo Professional, MediaPrints is unequaled for visualizing cable TV coverage. Developed by The Janus Group in conjunction with Warren Communications News, MediaPrints features data from the Television & Cable Factbook, and includes digital service areas, high speed Internet access areas, with cable overbuilds and wireless systems represented as separate mapping layers.*" The MediaPrints data set contains geographic information that represents franchise boundaries for cable operators throughout the United States. These boundaries in turn contain the information specific to the cable operator.

greater population density, or areas similar to those referenced in **Part I** as Town Center regions) and, not surprisingly, do not tend to serve the largely uneconomic Outside of Town areas from **Part I**. The table is based on geo-coded data about cable operators, segregated on the basis of telephone wire centers. The locations of the cable service are then matched with the telephone household density data and the relative telephone investment information. Investment data for the telephone companies are assumed to be proxies for the relative cost differences that would confront any other facilities-based builder of network infrastructure.[30] It is assumed, for example, that if telephone loop plant investment costs rise by a factor of two outside the clustered population center, then investment costs for cable or any other facilities-based entrant in rural regions would rise by a like proportion in rural regions since labor and aerial/trenching costs are similar.

Table 6: Summary characteristics of geo-coded cable operations in rural regions

Non-cable-served regions	Cable-served regions
1.4 lines/square mile (median)	44 lines/square mile (median), 31x the non-cable-served median
33% of all CSAs	67% of all CSAs
$4,327 average investment per line, 2.3x the cable-served average	$1,888 average investment per line
16% of total lines in all wire centers	84% of total lines in all wire centers
30% of total investment in all wire centers	70% of total investment in all wire centers

Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

The primary insights in the table are revealing. First, cable service is not ubiquitous. In fact, based on this study of telephone company rural service areas serving more than 350,000 lines, approximately 16% of the telephone-service lines (or more than 56,000 lines/customers) and 33% of the carrier serving areas (CSAs) are *not served* by cable operators. Further, as one studies the characteristics of the areas with no cable service (and therefore no potential for cable telephony), the areas appear to have very similar characteristics to the high-cost Outside of Town regions analyzed in **Part I**. In the non-cable-served regions, the telephone line density per square mile is 1.4 lines compared with 44 lines per square mile in the areas where cable is providing service. Thus, the cable-served regions are 31x denser than are the areas that are not served by cable. Further, it is not surprising to find that in areas with no cable coverage the average telephony investment per line is more than twice the level per line where cable is present, again a proxy for the cable capital required to serve Out of Town areas. Finally, the number of

The data reflected in this analysis were created by overlaying the MediaPrints Franchise Boundaries (FB) over Customer Serving Areas (CSAs) generated by telephone company geographic models. CSAs were considered "cable-served" if they intersected any part of the FB. Any customer within a cable-served CSA was counted toward the total number of cable-served customers. This same approach was used to determine total telephone company investment within the cable-served areas.

While the telephone company models use sound techniques to determine customer-specific location and investment, the MediaPrints data are only as good as the information provided by individual cable operators. As such, there are instances where the franchise boundaries are not logically placed. However, for present purposes, a credible set of data are generated using these franchise boundaries.

[30] The investment data found in this section regarding cable competition is slightly different in nature than the investment data used in the analyses performed to determine returns on investment in Part I. Recall that in Part I, return on investment is calculated based on *net* modeled investment, that is gross modeled investment required to provide R1/B1 "supported services" (loop, transport, and switching) reduced by an estimation of accumulated depreciation. The investment data found in this section are modeled loop investment only and are presented on a gross basis (i.e., not reduced by estimated depreciation). The gross loop investment data are utilized to demonstrate the critical relationships and directionally are consistent with those net investment data found in Part I.

telephony lines in the non-cable regions is approximately 16% of the total telephony lines served across the same regions. However, the non-cable-served regions are estimated to require a disproportionately high 30% of the total investment—consistent with the higher per-line capital requirement incurred by telephone companies.

In the non-cable-served regions, the telephone line density per square mile is 1.4 compared with 44 lines per square mile in the areas where cable is providing service (the cable-served regions are 31x denser).

The findings highlight that cable operators generally are building or serving in regions that are denser and less capital-intensive (like the Town Centers), and they are not serving outlying regions. As demonstrated in **Part I**, return on investment is significantly tied to metrics of high relative density and low relative capital investment. The phenomenon is entirely reasonable. First, the cable operators generally have municipal obligations to build within the towns. Second, the Outside of Town regions are sparser, require markedly higher per-line investments, and offer lesser opportunity for favorable returns. Because the cable operators have the freedom to make sound business decisions regarding where to focus their operations, they are selective about where they build plant. Cable operators and other facilities-based competitors are rationally choosing to invest their capital and compete only in markets that appear economic to serve. As the Provider of Last Resort, however, incumbent telephone companies have no such choice, which was an acceptable outcome in a non-competitive and monopoly market. In the face of targeted competition, however, incumbents face the stark reality of eroding share and profitability in regions that have been economic to serve, while competitors leave the uneconomic regions to be served by the telephone companies as a result of regulatory mandates. A financial shift is occurring because of competition, and it has predictable implications, which include more financial distress for carriers that have POLR obligations.

Additional detail on competitive patterns in Texas rural regions

Table 7 summarizes additional detailed data from the analysis of cable competition in representative rural Texas wire centers (WCs). In this case, the segregation of data is according to the size of the telephone company wire centers. The groupings include wire centers serving (i) less than 500 access lines, (ii) 500 to 1,000 lines, (iii) 1,000 to 5,000 lines, and (iv) those serving more than 5,000 lines. The first three rows provide some general metrics regarding the composition of wire centers, lines, and required investment (forward-looking modeled) among the four wire center groupings. For example, the dotted box reflects that 5.6% (1.4% + 4.2%) of the total carrier lines are in wire centers that serve less than 1,000 lines each. However, the total investment for those lines represents a disproportionately high 18.1% (5.8% + 12.3%) of the total carrier investment. By contrast, in the solid box at the right, wire centers with greater than 5,000 access lines serve 62.8% of the carrier's total lines and represent a disproportionately low 37.0% of the total modeled per-line investment. The findings demonstrate, as one might suspect, that smaller wire centers have relatively lesser line density and relatively greater per-line investment cost requirements (percentage of total investment is materially higher than the percentage of total lines).

Table 7: ILEC serving areas with or without cable service, segmented by number of access lines in the wire center

	< 500	500-1,000	1,000-5,000	> 5,000	All WCs
% of Total WCs	15.9%	21.5%	43.9%	18.7%	
% of Total Lines	1.4%	4.2%	31.7%	62.8%	
% of Total Investment	5.8%	12.3%	44.9%	37.0%	
% CSAs with No Cable	54.5%	38.1%	32.8%	23.0%	32.7%
% of Lines Cable-served	39.7%	68.9%	71.0%	93.1%	84.4%
% of Lines No Cable	60.3%	31.1%	29.0%	6.9%	15.6%
	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Representative confidential Texas LEC data and Balhoff & Rowe, LLC.

The last three rows of **Table 7** reflect the availability of cable telephony within the four wire center groupings. Based on these data, it appears that cable operators are much less likely to serve smaller exchanges in less dense regions where disproportionately high investment is required. The table notes that the larger wire centers that serve more than 5,000 lines appear to have cable coverage of 93.1% of the total lines in the wire centers (solid box at the lower right), while wire centers serving fewer lines such as those with less than 500 lines have only about 40% coverage of total lines in those exchanges, leaving 60% of the lines with apparently no cable alternative for telephony, data or video (solid box at lower left). The middle row on the table provides additional insight, as the cable service is even more concentrated when analyzed in terms of carrier serving areas (effectively Town Center areas close to the central office within a wire center). The row highlights that more than 50% of the wire centers serving less than 500 lines have *no cable telephony service within the central office-served portion of the wire center region (recall that this tends to be the lowest-cost, densest portion of each wire center)*, and approximately 23% of the rural wire centers serving more than 5,000 lines have no cable service at all. The box at the middle right of the table indicate that 33% of the wire centers have no cable service in any portion of the CSA (Town Center and Outside of Town) at the present. The detailed data reinforce the message presented above in this section, that cable operators appear to be targeting their service in an economically rational fashion to the densest, lowest-cost, lowest-investment, highest-profit rural regions, with relatively little focus on lightly-populated, high-cost and uneconomic areas (as one would expect from a largely unregulated and profit-maximizing industry).

The larger wire centers that serve more than 5,000 lines appear to have cable coverage of 93.1% of the total lines in the wire centers, while wire centers serving fewer lines, such as those with less than 500 lines, have only about 40% cable coverage of total wire center lines.

The simple conclusions from the previous table are that cable service is not ubiquitous in the high-cost regions. **Table 8** makes the same points using a different metric—line density per square mile. The table offers median (middle value) figures to exclude the skewing of more extreme statistics. The data highlight that line density per square mile drops sharply from right to left in the table for cable-served areas—from the larger wire centers to the smaller ones. In wire centers where there is cable service and the telephone company serves more than

5,000 lines, the line density per square mile is 738, falling to 66 in the wire centers serving 1,000 to 5,000 lines, to 17 in the 500 to 1,000 line wire centers, and to a paltry 0.4 per square mile in the wire centers serving less than 500 lines. Notably, the regions where there is no cable service are significantly less dense. The median line density in parts of the wire centers where there is no cable service falls below 5 lines per square mile in all of the wire centers.[31] The table provides verification and quantification regarding the economically rational behavior of a major "competitor" for telephony services (recall that cable coverage is significantly greater in the larger wire centers, where we see higher line densities for the cable-served regions). This is behavior that a telephone operator would employ in the absence of material financial support for high-cost operations, again assuming that policymakers did not require a more extensive and expensive commitment.

Table 8: ILEC line density per square mile in areas with or without cable service, by wire center size

	Wire Center Line Count				
	< 500	500-1,000	1,000-5,000	> 5,000	All WCs
Median Line Density (per sq. mile)					
Cable-served	0.4	16.8	66.1	737.9	43.8
No Cable	4.7	-	3.9	0.5	1.4

Source: Representative confidential Texas LEC data and Balhoff & Rowe, LLC.

The final table in this section highlights gross investment per line, based on forward-looking cost models functionally similar to those employed by the Texas PUC. **Table 9** provides the gross telephone investment per line in regions where there is cable telephony service offered as well as in regions where there is no cable service. In this analysis, the *average* telephone investment per line in cable-served areas is about $1,888 compared with $4,327 per line in areas with no cable offering (first solid box at the right). Therefore, non-cable-served areas require higher investment that averages about 2.3 times the investment in cable-served areas (the investment is 129% higher). The table again verifies that cable operators are more likely to serve where the investment per line is lower. In the instances where virtually all the wire center lines are served by cable operators (0-1% column), the telephone company's investment costs are about $1,731 per line in the cable-served area. In that same column, the few areas without cable services have investment costs that are about $15,601 per line or more than 9 times higher.

The average telephone investment per line in cable-served areas is about $1,888 compared with $4,327 per line in areas with no cable offering.

[31] There are likely factors that explain the cable service in the wire centers serving less than 500 lines—one would expect cable operators to server in denser regions—but the number of lines is small in the exchanges serving less than 500 lines and there may be explanatory factors such as the possibility that certain cable service territories in sparsely-populated regions may be adjacent to other more attractive regions. Whatever the explanation for that column, the point is relatively clear when looking at the compiled statistics for all wire centers—cable operators are targeting their operations to provide service in denser regions and are less inclined to serve more sparsely-populated, higher-cost regions.

Table 9: ILEC per line investment in wire centers where cable competition is or is not available

	% of Lines in WC with No Cable				
Actual $s	**100%**	**40-99%**	**1-40%**	**0-1%**	**All WCs**
Average Investment per Line					
Cable-served	NA	$ 4,644	$ 1,904	$ 1,731	$ 1,888
No Cable	3,720	4,430	4,706	15,601	4,327
Variance - No Cable vs.:					
Cable-served - $s	NA	(214)	2,802	13,870	2,439
Cable-served - %	NA	-4.6%	147.2%	801.3%	129.2%

Source: Representative confidential Texas LEC data and Balhoff & Rowe, LLC.

The summary points in this section are that competition in the form of cable telephony is occurring or will occur in a targeted fashion, primarily in more-densely populated regions (i.e., similar to the Town Center regions examined in **Part I**), generally in larger exchanges, and where investment costs are sharply lower. This data-driven demonstration of "cherry-picking" of the most profitable service territories provides a compelling answer to the question of whether there is a need for continued universal service support in wire centers where competition is emerging. Simply stated, *the data verify that the competitor will choose to selectively serve customers, and will focus on only the most densely populated and profitable subset of the wire center, given the lack of a POLR obligation. Consequently, the incumbent telephone operator, which continues to be bound to serve all customers in a wire center, is left to face stiff competition in its most profitable operations while serving as the sole service provider in the high-cost, low-density areas that cable companies are likely to avoid. Far from eliminating the need for USF support, competition concentrated in towns actually exacerbates the financial need for high-cost support in outlying regions.*

The data verify that the competitor will choose to focus on only the most densely populated and profitable subset of the wire center, given the lack of a provider-of-last resort obligation.

How does vigorous facilities-based competition targeted at population clusters affect POLR policy?

The discussion regarding competition has focused on the emerging products provided by *cable competitors using VoIP services. The next study relates to telephone companies that have chosen to overbuild other incumbent telephone companies.* In certain Texas exchanges, other carriers—often cooperative telephone companies—are "edging out" into adjacent regions and overbuilding the properties served by an incumbent carrier. These competitive builds are another illustration of how rational competitors, again all telephone companies in this illustration (not cable operators), are actually targeting certain properties and bypassing others. The key points in this section are that facilities-based competitors can be very successful in selectively taking high percentages of the most profitable market share in a service region. The net effect is to leave the incumbent with less ability to support the often deeply unprofitable services in the Outside of Town regions. Further, the costs of the POLR can be quantified to be substantially higher than they are even at the present *if the carrier had only the uneconomic regions to serve and did not benefit from the scale associated with serving more economic and competitive rural regions.*

From the outset, it is clear that competition is generally good for most consumers. The principle is clear in terms of policy and economic benefits. However, Texas policymakers are asking important questions about how competition affects policy and whether it relieves the policymaker of the need to provide USF? The apparent answer, based on the data presented earlier, is that USF is needed in certain Outside of Town markets, where there is no competition and where no competitor is likely to serve. Still, as USF payments are averaged across wire centers and across study areas, it is possible to lose the core economic service area, dramatically altering the incumbent's fundamental operating costs and the USF receipts that were designed to support certain high-cost regions within a larger exchange.

To understand the potential effects of losing the core, this subsection addresses the potential for significant economic distress if competitors are successful in taking substantial market share in the more densely populated town clusters. The analysis in this section is based substantially on forward-looking cost/investment modeling and analytical work performed by financial consultancy CosTex. The analysis is related to 25 competitive rural Texas exchanges, again where other telephone companies (not cable operators) overbuilt a carrier's service region.

Initially, CosTex modeled each of the 25 rural exchanges to determine what were the investment/cost characteristics inside the geo-coded population clusters ("Core" regions) and the investment/cost characteristics in the sparsely populated areas outside of the cluster ("Non-Core" regions).[32] Then, CosTex considered the investment/costs that would occur if the incumbent lost the more profitable parts of the exchange. CosTex's analysis posited that the network might be built to serve the outlying areas without the averaging benefit of the in-town and clustered properties. The result is a forward-looking analysis of the costs *without the averaging effects achieved by serving the more profitable regions.* The differences in investment are strikingly higher outside the town *without the core service region*. This scenario is becoming increasingly possible as low-cost cable telephony services the core population clusters.

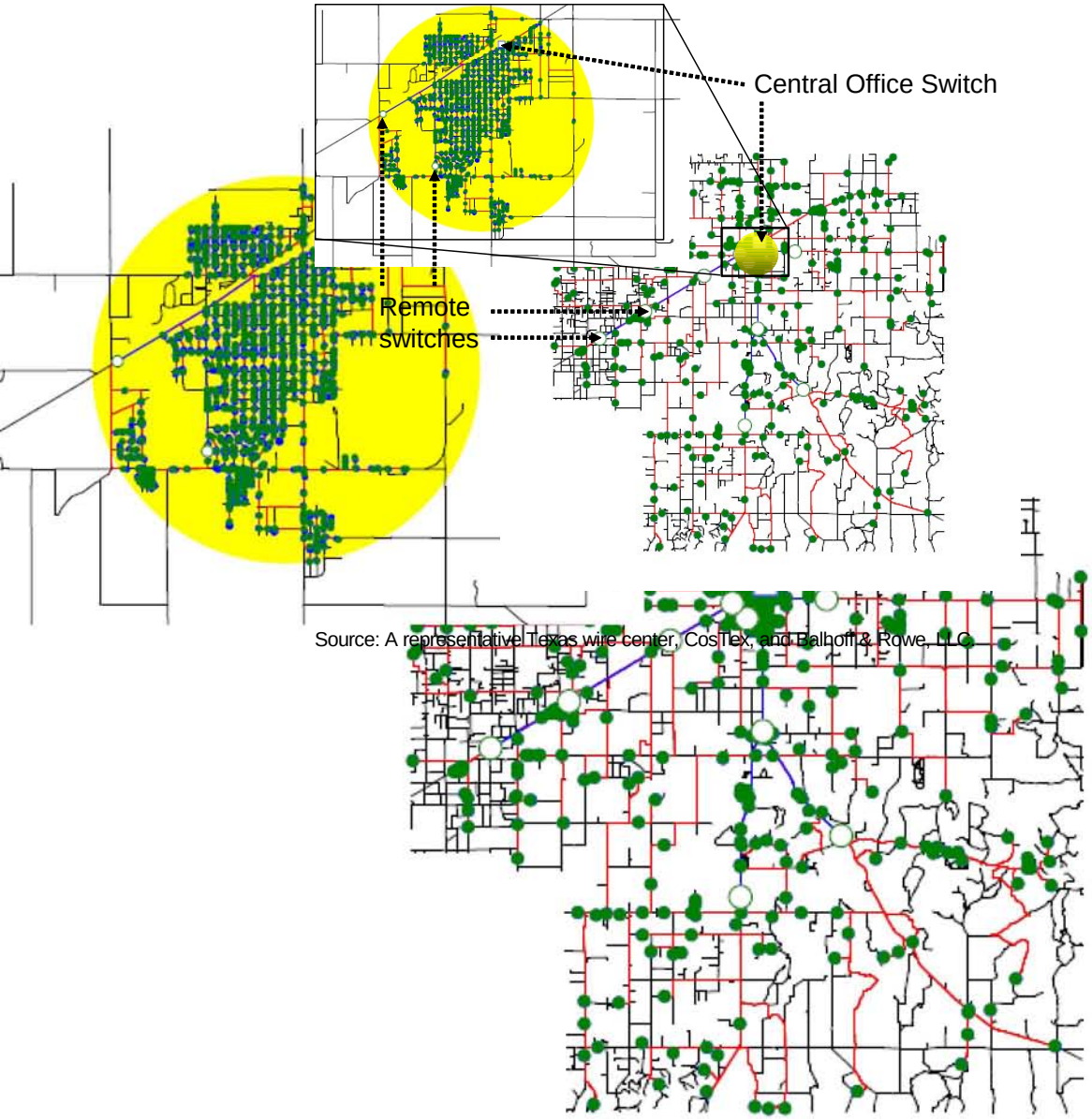
CosTex's analysis examines the costs of networks built to serve the outlying areas without the averaging benefit of the in-town properties.

The set of rural Texas wire centers used to perform Core/Non-core analyses is *different from the group of wire centers that were used in the Town/Outside of Town analyses* in **Part I.** As explained in the footnote, CosTex analyzed the 25 wire centers by specifying a relatively high-density circle in the middle of each exchange. The radius averaged about 4,600 feet, ranging from a low of 2,000 feet to a high of 8,500 feet. To illustrate the concept, one of the exchanges studied is depicted in **Figure 9**. The figure includes a Core clustered region (circular, highlighted

[32] The model used for the Core/Non-Core analysis was developed by CosTex. It has a feature that allows for the placement of telephone plant in a given wire center based on a set radius from a designated central point within the wire center's service region. In the case of this analysis, the central point within the wire center was the Central Office location, but the model can set a starting point at differing locations within the wire center territory. Once the central point has been established, the model can be used to assign a radius in feet from the central point to model the outside plant. This radius can be unique for each wire center. In the case of the 25 competitive rural exchanges in this analysis, the radius was set to include the highest density area for each of the exchanges. The model also has user preferences which can be set to "build" outside plant either within the designated radius, outside the designated radius, or ignoring the radius limitation for the customer locations both inside and outside the radius setting. The radius setting has nothing to do with the traditional engineering breakpoint for copper/fiber which is still being used within the model and has been set at 12,000 feet. Importantly, this model allows the analysis of something different from the other analyses in this paper. It permits an analysis of the outside plant costs that would result if the incumbent Provider of Last Resort served only part of the customers in a wire center, once competition has taken large numbers of the higher density customers in the central area of the exchange. *Effectively, the model permits an understanding of what the investment costs would be if the incumbent were to lose the core service region and had only the outlying districts to serve. Alternatively, the model can also determine the expected de-averaged costs of the competitor within the central area of the wire center.*

area) that covers about 80% of the wire center's lines. This kind of analysis was performed on each of the 25 wire centers. The dots represent actual termination points (phones) at customer homes or businesses, while the circles depict remote telephone devices (usually in neighborhoods) that are used to combine individual telephone lines onto larger lines to send the traffic to switches.

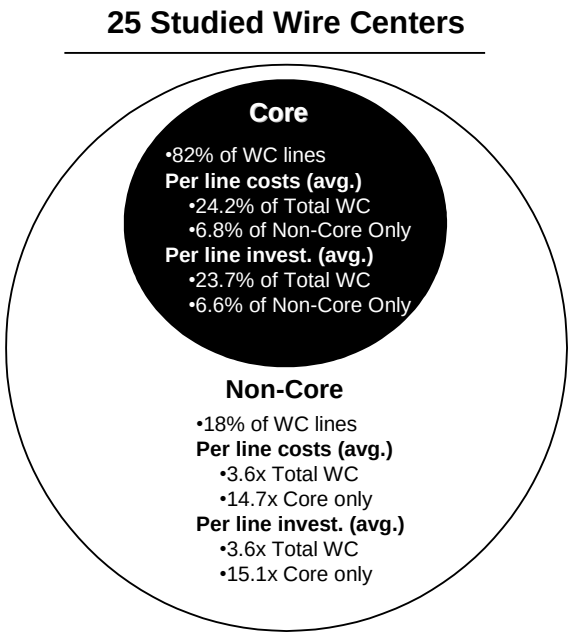
Figure 9: Clustered analysis of wire center service regions



Source: A representative Texas wire center, CosTex, and Balhoff & Rowe, LLC

CosTex's findings are summarized in **Figure 10**, which illustrates certain statistics that were generated for each exchange and then totaled for this presentation. The data highlight the percentages of lines in the Core and Non-core, as well as investment costs in total and per-line for the two "regions."

Figure 10: Hypothetical analysis of investment & operating costs in 25 wire centers with actual facilities-based telecom competition



Source: Sampled Texas rural company data, and Balhoff & Rowe, LLC.

These data are, of course, hypothetical, but they highlight an even starker contrast in costs between the clustered Core and the sparser Non-Core. While the earlier analyses in **Part I** and the first sections of **Part II** point up the difference in the Out of Town versus Town regions, there is still an *averaging effect in the modeled calculations* due to assumptions that include Core or Town Center factors. The CosTex analyses exclude those averaging effects to highlight the extreme if the network were only built to serve the uneconomic regions. The analyses reinforce what was observed in the other data—investment and operating costs outside of the population cluster are significantly greater than the costs inside the cluster and for the wire center as a whole.

The conclusions drawn from this analysis are even stronger. The costs—investment and operating—that are modeled for serving *only* the Non-Core regions are substantially greater than the total wire center average and the Core-only average. The Non-Core per-line network investment and operating costs are almost 4 times higher than the total wire-center figures, which include the less costly Core lines. If the network were to be built to serve the Non-Core *alone* versus the Core *alone*, the per-line investment and operating costs are estimated to be

about 15x greater in the Non-Core compared with the Core-only region. Stated more directly, if a carrier is required to serve only the Non-Core region, due to the loss of its customers in the Core region as a result of targeted competition, it will bear costs that appear very high and are almost certainly uneconomic. In such a scenario, if the customers in the Non-Core/Outside of Town regions are to be served at affordable rates, it likely will require even greater financial support to the POLR, since the POLR today depends on some assumed internal cross-subsidization that effectively *reduces* the amount of USF necessary.

Non-Core per-line network investment and operating costs are almost 4 times higher than the total wire center figures, which include the less costly Core lines, and they are 15x higher for a Non-Core network alone versus a Core Network alone. If the customers in the Non-Core/Outside of Town regions are to be served at affordable rates, it likely will require even greater financial support to the POLR, since the POLR today depends on some assumed internal cross-subsidization that effectively reduces the amount of USF necessary.

While the data in this section of the White Paper are not comprehensive and the sample size in certain cases is relatively small, there is every reason to believe that the patterns are consistent with other regions in Texas and across the nation.

Summary

Part II focused on important data and policies with respect to competition. In summary, competition has emerged in key markets, including long-distance, business services and most recently lower-cost residential markets. Competition is most apparent in clustered population centers today, that is, where multiple carriers can invest and generate an appropriate return on investment. In uneconomic, very high-cost regions, however, there appear to be relatively little or no competitive infrastructure commitments. The reason is that infrastructure and operating costs remain prohibitively high in those regions. The data also suggest that the Provider of Last Resort is likely to experience meaningful competitive pressures in the more profitable service areas, possibly losing as many as 20% of its lines to cable and to other VoIP providers within about two years of competitive entry. The result is likely to be a rapid collapse in the ability to cross-subsidize the higher-cost regions. More ominously, the modeled high-cost regions will require relatively higher investment per line *without the ability to average costs over the same number of lines that include today's more profitable regions of service.* This shifting financial scenario raises questions, not about whether USF support should be reduced or eliminated, but about the sufficiency of today's USF system which is based on averaged geographies. As explained in the next section, the legacy cross-subsidy methods of supplying support for costly policy goals appear to be no longer sustainable, and indeed may subject the Provider of Last Resort to increased likelihood of competitive attack in areas where profits have to be maintained at excessive levels. Therefore, explicit support mechanism such as USF would appear to be essential if ubiquitous and affordable services are to remain as core policy goals.

The data suggest that the Provider of Last Resort is likely to experience meaningful competitive pressures in the more profitable service areas, possibly losing as many as 20% of their lines to cable and other VoIP providers within about two years of competitive entry.

Part III: Universal Service System Evolution: Yesterday, Today, and Tomorrow

The previous sections of this White Paper probed financial data about the viability of affordable "supported services" to consumers in high-cost regions, with special focus on uneconomic areas. The telephone company financials highlighted the concentration of profitability in Town Centers of rural areas, and revealed that competitors are engaging in selective targeting of markets. The reality appears to be entirely predictable and reasonable, as competitors focus on rural service territories where profits can be gained, while leaving the POLR-company to serve uneconomic areas. However, as profitable services within the former monopoly are no longer able to support unprofitable services, and as competition accelerates, policymakers will rightly become more concerned about how universal service should be understood and reformulated. This section looks to history in a brief review of the USF program to gain insight into universal service goals and trends. Based on this context, the suggestion is that universal service is and has been a commitment by policymakers to enable the provision of affordable basic communications services to all consumers through provider- or carrier-of-last-resort networks notably aimed at serving non-competitive regions. However, the clear trends reveal that competition has forced increasingly explicit commitments to universal service, and will likely require a more explicit set of changes again. The key messages in this section are the following.

- **Universal service previously was founded on internal cross-subsidies within a monopoly telecommunications system.** Over the first half the twentieth century, a "system" developed by which consumers benefited from a policy compact that committed to pervasive infrastructure and affordable rates. The system financially supported network services in high-cost, uneconomic regions.
- **As competition emerged in telecommunications, new systems were created to continue the support of ubiquitous and affordable telecommunications networks.** Beginning with the competitive pressures on the long-distance marketplace in the late 1960s and early 1970s, policymakers deliberately readjusted the universal service system away from implicit mechanisms to more explicit support to ensure competitive equity and, at the same time, provide ongoing support for high-cost regions that were financially vulnerable.
- **Today, the accelerating competitive services in certain rural residential markets will require a further readjustment of USF.** With the advent of more competition through cable VoIP and other services targeted at the more economic rural regions, universal service funding will have to be maintained, assuming policy goals of ubiquity and affordability are unchanged, to support networks in markets that are truly uneconomic. Such a readjustment is consistent with the history of the USF program.
- **In a competitive market environment, USF should be defined more sharply and targeted to specific high-cost properties, and should be independent of a company's rapidly eroding internal cross-subsidies.** With the advent of competition in virtually all parts of telecommunications, it appears that a policy system relying on internal company cross-subsidies is unsustainable. Therefore, policymakers should view explicit support mechanisms as providing critical legal "consideration" for the fulfillment of specific POLR network obligations in uneconomic regions. These services should demonstrably advance clearly-defined policy goals of ubiquitous and high quality service to consumers and other carriers at reasonable rates. That is, a carrier should be assigned support for meeting or supplying a defined public "good," while at the same time the carrier is permitted to earn whatever profitability it is able to achieve in other competitive markets. The insight here is that a rational competitor in today's markets would choose to serve regions which are profitable and would avoid regions where returns are insufficient or negative. Absent explicit "consideration," carriers should not be expected or required to assume costly POLR obligations. Further, a requirement for internal company cross-subsidies is anticompetitive when the carrier is competing in other markets which are supposed to be the source of the cross-subsidization.

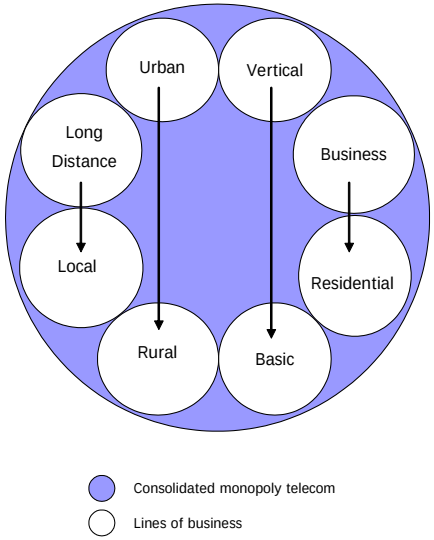
Summary of USF history

It is helpful to review the history of universal service to understand what USF was, why changes occurred and why they might be needed once again. The history is presented to glean appropriate "lessons" about *what might/should happen* as Texas regulators and other policymakers review the current financial data. In short, does history provide a template by which to view today's changing environment?

Some commentators have suggested that universal service as an *explicit system* did not exist before the advent of long-distance competition. The assertion is correct that USF systems were not *explicit* in the earliest stages of the last century. But it is incorrect to state, as some have contended, that the policy foundational to universal service was created in 1970 as a "revisionist" formulation. The "revisionist" interpretation renders the policymakers in the 1970s and in the years afterwards as unwitting, and suggests that policymakers misunderstood the foundational policies affecting their citizens' welfare. It also understates the import of key evolutions in policy and systems.

In fact, it appears that the goals of ubiquitous, affordable, comparable rates and services were suggested early in the 1900s and were certainly articulated in the 1934 Communications Act. The monopoly system realized those goals in ways that probably were not fully anticipated in the early 1900s. However, when emerging competitive forces challenged and irrevocably altered the "implicit system," policymakers considered their options about capital/policy commitments and purposefully changed the system. The shape of the evolving systems, therefore, reflected choices to provide financial support for uneconomic higher-cost network elements by modifying a traditional monopoly system that began with internal company cross-subsidies. Those cross-subsidies are simplified and reflected in **Figure 11**.

Figure 11: Monopoly Model of Support



Source: Balhoff & Rowe, LLC.

USF went through various stages that can be defined as a movement from monopoly-provision of services that benefited the public through company and policy agreements about internal cross-subsidies. The changes in the system occurred when new competitive services eliminated the opportunity to draw on some source of company internal support, and required that the competitors bear equal responsibility to support the provision of policy-based services to other areas. These watershed competitive outbreaks were not signs that universal service was unnecessary. Rather, *they were challenges that made it necessary to alter the system* to ensure that no provider was treated unfairly. And they were competitive evolutions that required policymakers to make more explicit what was previously an implicit set of funding mechanisms. There were two clear historical tenets. The first tenet was that there should be *competitive equity* for carriers in competitive markets, so that obligations in collecting monies should not distort the competitive markets. The second tenet was that there should be *more explicit funding systems* to support uneconomic regions.

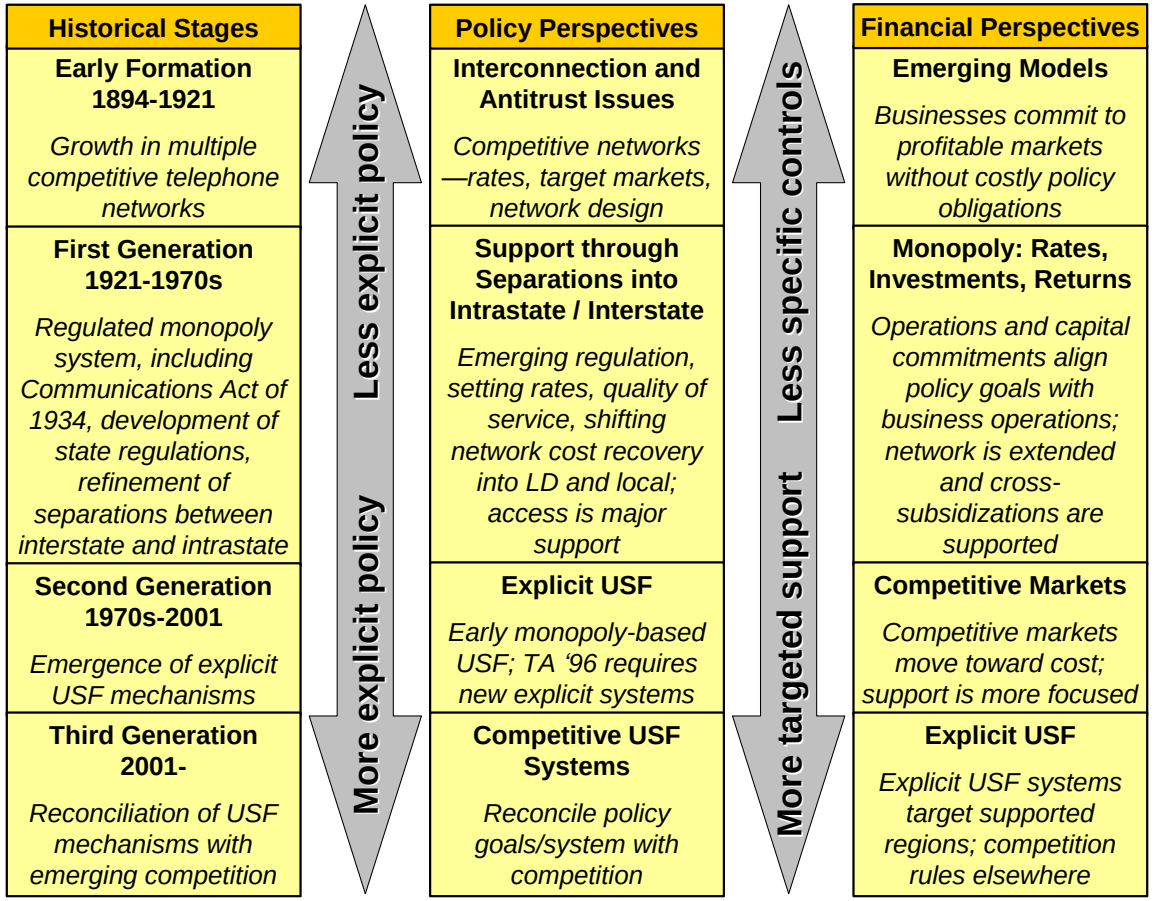
There were two clear USF historical tenets. The first tenet was that there should be competitive equity for carriers in competitive markets and the second tenet was that there should be more explicit funding systems to support uneconomic regions.

Generations in USF evolution

A graphic rendering of the evolution of universal service is suggested in **Figure 12**, which proposes a division of the history into three generations, after an initial formative stage. The stages are defined by demonstrable changes in issues regarding competitive equity and the degree of explicit funding.

Before the 1921 Willis-Graham Act, telecommunications markets were nascent and the carriers were generally free to choose their own financial model, as there was relatively little policy intervention. The early formative period was effectively pre-USF. In the first stage or the monopoly period, after the 1921 Willis-Graham Act, communications companies built their network operations with a view to a policy compact—protection from competition while capital was directed in a way that was consistent with both corporate and public goals. The second-generation universal service formulation began when the monopoly structure began to erode by the late 1960s, that is, when the first signs of competition challenged internal and implicit cross-subsidies. In this era from about 1969, policymakers responded by creating "competitively neutral" systems to ensure that communications services could be maintained in high-cost parts of the communications network. Then, with the implementation of the Federal Telecommunications Act of 1996 (FTA), policymakers continued to struggle with a shrinking source for internal company cross-subsidies and the need to define and fund policy goals more explicitly. Finally, the third stage appears to be emerging from the time of new technology-adoption in the form of IP-telephony which reaches smaller markets and the vast majority of residences. Once again, alternative technologies are forcing regulators to re-tune their systems related to collection and disbursement of USF. While the specific date can be debated, it is not as much the FTA that is forcing today's evolution as it is a new technology-platform that is enabling residential—even rural small business and residential—competition. That set of changes is causing regulators to ask whether the system is competitively correct and appropriately explicit.

Figure 12: USF Stages



Source: Balhoff & Rowe, LLC.

The graphic emphasizes that competitive factors have driven regular evolutions in the USF system. It is not the need for USF that is really being questioned, but whether the system is sufficiently explicit and targeted. This White Paper suggests that the universal service regime is undergoing a predictable transition that requires a more focused financial understanding of the needs and the goals of the USF program. In effect, a new lens is required through which to view the legacy commitment to universal service. It appears that the primary problems of serving high-cost areas remain the same as they were many years ago, when policy addressed elevated investment costs. Universal service—ubiquitous communications technologies that are affordable and comparable—has, in many ways, not changed in substance over the last century. However, the import of the commitment and the structure of the mechanisms have changed. Effectively, the lens has become sharper as services became more widespread in the first half of the twentieth century and implicit cross-subsidizations became the rule. The issues became even better focused when competition emerged in the long-distance markets, and new explicit support mechanisms were required in the form of clear jurisdictional separations policy and access payments. In the FTA, there was a legislative mandate for a further refinement of the systems to accommodate a pro-competitive policy that involved access and universal service reforms. However, it is only as technologies began to develop that this latest stage has begun to play out more clearly. In every one of these migrations, the movement is toward more explicit policy and toward more targeted support that is collected in a competitively equitable manner from all the carriers.

The investment and income statement data presented in **Parts I** and **II** of this report suggest that policymakers are now wrestling with a historically-consistent optical adjustment, as technologies have set free a new competitive set of forces. Today's adjustment will require a new definition of what is necessary to fulfill public policy goals and determine requisite explicit financial support mechanisms, all designed to ensure that customers have access to social and economically valuable communications. As has been the case in previous eras, the challenges include finding formulae that do not create competitive distortions in naturally competitive markets, while crafting more precise mechanisms for a disbursement system that is appropriately targeted.

A sharpened USF doctrine in providing financial support for policy-based services

This White Paper has supplied data regarding the high investment and operating costs in sparsely-populated regions. Texas policymakers will ask themselves what all of this means for the universal service system? Does a theoretical frame of reference emerge from these financial data that permits an appropriate evolution of Texas universal service? Can such an evolution be theoretically consistent with the various policy goals that have been articulated over the last century, and most recently since the Federal Telecom Act of 1996? Can these data *sharpen* the core understanding of USF and an appropriate system that supports it?

Does a theoretical frame of reference emerge from these financial data that permits an appropriate evolution of Texas universal service? Can such an evolution be theoretically consistent with the various policy goals that have been articulated over the last century, and most recently since the Federal Telecom Act of 1996?

The legacy challenge

To briefly restate the earlier sections of this White Paper, there are customer regions that are very expensive to serve. Those Out-of-Town regions appear to constitute about 20% of the rural regions that were sampled in this study. The regions are sub-wire center geographies where the distance from the switch is greater than 12,000 feet, the density of coverage is very low, and the customers live outside of population clusters. Importantly, the financial characteristics are so severe that these properties require investment that is multiples higher—averaging about 2 times in this study (or 15 times higher if the averaging effects of the network are excluded)—compared with costs in rural townships. It is unreasonable to expect a carrier to provide basic or advanced telecommunications services in these regions unless there are very high service rates or some support such as USF. Further reinforcing this message are data indicating that no other carriers appear to be providing service in very low-density and uneconomic regions. The very clear problem is that costs are far too high for a rational carrier to provide POLR services without support.

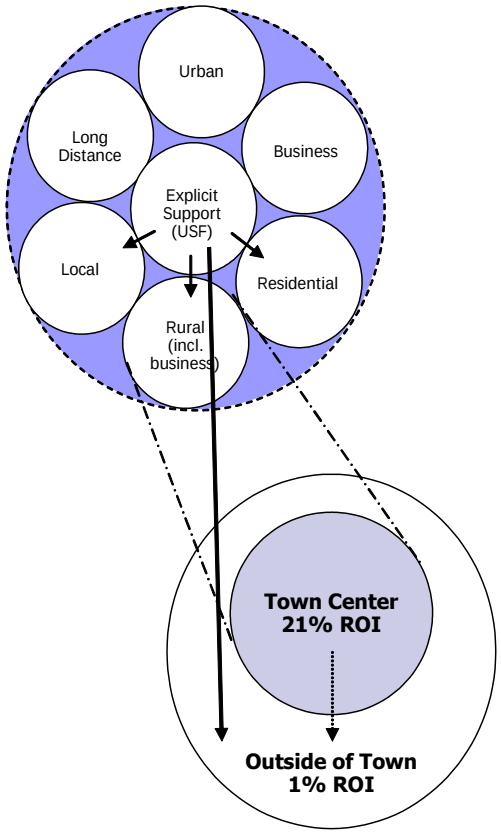
The legacy policy and solution

The legacy policy has been that telecommunications services *should be provided to all customers* for societal reasons—education, safety, or quality of life—and for economic reasons. A ubiquitous high quality network has provided beneficial access to and from customers in rural and insular regions. In the earlier decades of the twentieth century, the network economies worked, as they were accomplished through the averaging effects within a monopoly telephone system, as explained in more detail in **Appendix II**.

Today, the USF problem is both similar to and different from the legacy policy and solution as it evolved over the last century. The financial problem of high-cost properties continues to exist, and is fundamentally the same as in the past. The vast majority of customers in sparsely-populated regions would almost certainly have inferior services and would be unable to pay for services if it were not for universal service in support of networks. However, the data in this White Paper suggest that the system will have to change to eliminate anticompetitive requirements for internal company cross-subsidies and to achieve a more focused dedication of USF monies and obligations in very specific regions.

This White Paper provides data that suggest the need for better disaggregation schemes, but they also suggest that there is need for a more focused "doctrine" which is consistent with legacy USF doctrine. A graphic rendering of the probable direction of USF is found in **Figure 13**.

Figure 13: Refined Rural Support Model



Source: Balhoff & Rowe, LLC.

The refined USF doctrine should be based on a clear understanding of the integral and potentially inseparable relationship between USF and POLR.

The refined universal service doctrine should be based on a clear understanding of the integral and potentially inseparable relationship between USF and POLR, or carrier of last resort as it is called elsewhere. Monies are provided for a financial reason, which is to support . . .

(i) network investment
(ii) in specific regions that are so costly that
(iii) they cannot support carrier services, and
(iv) in exchange for the monies received, carriers are to be held accountable/be obligated for ubiquity, quality of service and regulatory monitoring.

A fifth part of the doctrine is also important and represents a more significant evolution beyond the legacy system: It is suggested here that USF should not be allocated in an averaged cost scheme that requires internal company cross-subsidies across study areas or potentially across even single wire centers.

The data in this study suggest that sub-wire center disaggregation is now or soon will be necessary to match the problem with the policy support solution. The reason for the change is that compulsory internal cross-subsidies invite arbitrage by competitors or impose anticompetitive obligations on incumbents whose operations in competitive regions are impaired as they try to fulfill their unique obligations in high-cost and internally cross-subsidized regions. It is not competitively neutral to continue requiring internal cross-subsidies in a rapidly emerging competitive marketplace. It was once possible to average, but it is fast becoming destructive of policy and public monies to remain so crude in allocating funds. USF and POLR obligations should be joined inseparably in regions where the financial realities dictate support. It might be suggested that USF does not make sense without clear POLR obligations, and POLR does not make sense without USF support if the region cannot economically attract investment.

It is not competitively neutral to continue requiring internal cross-subsidies in a rapidly emerging competitive marketplace.

The authors have wrestled with how the fundamental concept might be imaged so the rationale is clear. It might be suggested that policymakers over the last century entered into a "contract" in which POLR service is gained in exchange for support, which is similar to legal consideration by which both consenting parties gain a specific valuable benefit. Or it might be suggested that "compensated" service in the high-cost region is accepted by a carrier in exchange for defined regulatory oversight of investment, quality of service, and other accountabilities. Or it might be suggested more simply that policymakers wish to obtain a specific "good" or "product" for which they are willing to pay some appropriate "price" (USF funding). The early 1990s contract for services was previously more nebulous in its formulation, but is today in need of being more sharply framed. The critical doctrinal insight here is that there is a *specific exchange of monies for a specific policy value*. The product purchased or the consideration gained by policymakers is quality service in high-cost regions where no rational business would otherwise serve. The benefit to the company is the assurance that an appropriate—not an excessive—return will be provided over the life of the network assets.

Policymakers over the last century entered into a contract in which POLR service is gained in exchange for support.

Why is such a clear doctrinal formulation needed today? The reason is that there is meaningful confusion about what is USF, with the result that the purpose is not clear to some. Further, there are certain systemic failures that have occurred or are about to occur as some USF funds are spent arguably without accomplishing the purpose for which they were "intended."[33] Five insights flow from a more specific doctrine in which USF is represented as consideration or payment for fulfillment of POLR service in high-cost and non-competitive regions.

- **The achievement of specific policy goals is tied to funding.** Through USF support, policymakers agree to provide consideration or support in a contract with specific carriers that are willing to perform service in uneconomic regions. Thus the policy goals include ubiquitous, high-quality, reliable service at reasonable prices—fundamentally by acting as the carrier or provider of last resort.
- **Competition increases rather than diminishes the need for USF.** The introduction of competition does not automatically diminish the need for USF. The Texas PUC is rightly asking about how to reconcile competition and USF, but the insights that flow from this White Paper point to problems in the legacy averaging or internal cross-subsidy approach. In fact, (i) competition diminishes or eliminates the *opportunity for incumbent carriers to rely on internal cross-subsidies* from more economic and competitive regions to less economic sub-wire center regions, and (ii) price deregulation does not change or eliminate other regulatory responsibilities where the incumbent is required to serve regions that require USF to offset otherwise uneconomic investments. In fact, competition likely increases the need for explicit and targeted support streams, such as USF, unless policymakers abandon their goals of ubiquitous service at reasonable rates.
- **Clear obligations for recipients of USF.** USF payments to competitive ETPs or ETCs should be accompanied by clear obligations to commit network assets to service of demonstrably uneconomic regions. Notably, the concept of USF as a funding mechanism linked to specific policy choices makes it possible to realize and enforce the difference between a "subsidy" and a support payment for provision of certain defined network services. Further, if the regions are properly defined, it may be that the current USF payments are reduced as fewer or no competitive carriers are actually present in the verifiably uneconomic areas.
- **Elimination of USF should result in removal of the obligation to act as carrier-of-last-resort.** Reductions to USF are effectively eliminations of consideration for services, which means that those obligations that are no longer properly funded should be reduced or eliminated so the incumbent does not have to bear extraordinary and anticompetitive costs mandated by policy. Clearly, this trade-off should crystallize for policymakers the potential impact on consumers should financial support to compensate companies for acting in an uneconomic fashion be eliminated or substantially reduced. It is simply not economically or competitively equitable to require carriers to serve uneconomic regions unless there is a specific and quantifiable "contract" to serve—services provided in exchange for appropriate support payments.[34]
- **Permits expansion of universal service to broadband or other services.** This perspective on USF as a policy-driven funding mechanism also provides a theoretical foundation for any new universal service funding regarding high-cost broadband services or upgrades in acquisitions of high-cost properties that have not historically received support (i.e., RBOC rural operations). The analysis ties support for investment directly to the provision of policy-mandated services that otherwise would not be provided, or that would in the judgment of policymakers be under-provided, by firms acting in an economically rational fashion. The rationale is based on the premise that private

[33] USF has been assigned to provide acceptable returns on network investment in high-cost regions, but it might be argued that programs such as the competitive ETP and ETC plans have little reference to network commitments or to returns on allowed investment; at the same time, it should be noted that there is not a clear "intention" specified for USF.
[34] Note that investments already made and expenses already incurred to provide ubiquitous POLR services cannot be eliminated overnight. Many components of regulated telecom plant have very long depreciation lives, reflecting both the expected usefulness of the investments and regulatory requirements.

businesses have duties to financial stakeholders and are obligated to avoid uneconomic investment and expenses if there is not some other economic purpose such as a longer-term investment opportunity.

Obligations which are no longer properly funded should be reduced or eliminated so the incumbent does not have to bear extraordinary and anticompetitive costs mandated by policy.

Understanding the risk: as the POLR is isolated in the high-cost region, new problems emerge

To further emphasize the near-term risk if policymakers do not resolve the emerging USF problems, this section concludes with a hypothetical analysis to demonstrate the developing crisis. In light of the data in **Parts I** and **II,** the authors of this White Paper have attempted a "back-of-the-envelope" assessment of competitive activity and the financial effects that might be computed over the next five years.

The analysis is based on some of the data presented earlier, including the VoIP analyses from Banc of America and Bernstein Research described in the **Part II**. For this illustration, it is assumed that cable telephony services will be available in relatively low-cost rural areas served by cable operators, consistent with the geo-coded information presented in **Part II**.

The hypothetical is summarized in **Table 10** that includes several simplifying assumptions. First, secular line loss for the incumbent local carrier is set at a constant 3% over the forecast period. An assumption is made that VoIP providers or other facilities-based companies will capture approximately 11% market share in the first year, which is a pattern that has been verified in other rural communities, followed by another 8% share in the second year and an incremental 3% over each of the following three years. The 3% annual loss to VoIP carriers in the later years is posited to be conservative, but it should be noted that the data from the 25 competitive markets outlined in **Part II** suggest that the figure could rise in certain exchanges in five years to about 50%–60% instead of 28%.[35] This means that there is a realistic possibility of losing 28% (or even twice that level) of the incumbent's lines in a five-year period across the entire exchange, with the loss primarily or even exclusively in the clustered parts of the rural regions served by cable providers. The model assumes that depreciation remains relatively unchanged annually, but that operating cost savings result in 3% improvements annually, a figure that might be too aggressive in light of the high fixed-cost nature of a local carrier's properties.

[35] For data that is similar from other states, see the proceeding before the Iowa Utilities Board where Iowa Telecom cites loss of market share in its rural markets that exceed 50% across the entire exchange; further the competitors are not providing any facilities-based competition outside of town clusters; Coon Creek Communications v. Iowa Telecommunications Services, Inc., *Post-Hearing Brief of Iowa Telecommunications Services, Inc,* Docket No. FCU-06-42, (October 23, 2006), p. 22.

Table 10: A pro-forma projection of competitive losses in rural regions

	Base year	Year 1	Year 2	Year 3	Year 4	Year 5
Annual cable-served line loss	0.0%	11.0%	8.0%	3.0%	3.0%	3.0%
Cumulative cable-served line loss	0.0%	11.0%	19.0%	22.0%	25.0%	28.0%
Secular line loss	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Cumulative secular line loss	3.0%	3.0%	6.0%	9.0%	12.0%	15.0%
Annual total line loss		14.0%	11.0%	6.0%	6.0%	6.0%
Cumulative total line loss		12.0%	21.1%	25.7%	29.6%	32.6%
Annual reduction in operating expenses		3%	3%	3%	3%	3%
Cable-served revenues (as % of base year total revs)	100.0%	89.0%	81.0%	78.0%	75.0%	72.0%
Non-cable served revenues (as % of base year total revs)	100.0%	97.0%	94.0%	91.0%	88.0%	85.0%
Total revenues (as % of base year total revs)	100.0%	90.7%	83.8%	80.8%	77.8%	74.8%
Total operating costs (as % of base year total costs)	100.0%	97.0%	94.1%	91.3%	88.5%	85.9%
Operating costs (as % of current year revenues)	47.2%	50.4%	52.9%	53.3%	53.6%	54.1%
Operating income b/f deprec (as % of base year total EBITDA)	100.0%	85.2%	74.7%	71.5%	68.3%	65.0%
Operating inc. b/f depreciation (as % of current year revs)	52.8%	49.6%	47.1%	46.7%	46.4%	45.9%
EBIT (as % of base year total EBIT)	100.0%	57.4%	27.3%	18.2%	8.9%	-0.6%
EBIT (as % of current year revenues)	18.4%	11.6%	6.0%	4.1%	2.1%	-0.1%

Source: Balhoff & Rowe, LLC.

Profitability of rural incumbents providing "supported services" is very fragile in an environment where the most profitable clustered lines can be targeted and where high-cost regions allow very little flexibility in terms of cost-reductions.

The earnings in the rural regions for which the authors have geo-coded information are highlighted in grey in **Table 10**. The earnings or operating income before interest, taxes, depreciation and amortization (EBITDA)—a proxy for cash flow before financing, taxes, and capital expenditures—slips to 45.9% of revenues in year 5 from a 52.8% margin in the base year (actual data using current revenues and forward-looking modeled costs.) The EBITDA as a percentage of the base year EBITDA slips to 65% of the total, effectively cut by one-third of the base–period EBITDA. Further, the cash position of the company becomes graver as financing costs, taxes (if the operating profits were positive) and capital expenditures have not been factored into the EBITDA. Signaling the potential financial distress of the carrier, the operating income falls rapidly over the projection period and turns negative by the end of year 5, falling to a negative 1% of the figure reported in the base year.

The fundamental story is that profitability of rural incumbents that are providing "supported services" is fragile in an environment where the most profitable clustered lines can be targeted and where high-cost regions allow very little flexibility in terms of cost-reductions. The scenario is likely to be consistent with what has occurred in long-distance services, then business products, and more recently in competitive

urban residential areas.[36] Competition erodes the opportunity for generating appropriate profits in more profitable areas and using those profits to cross-subsidize internally high-cost regions where competitive entry is unlikely. The import of this analysis is that the advent of new cable-based technologies can, or will likely soon, erode more profitable provision of "supported services" and once again will focus the policymakers' choice on whether to supply adequate explicit support monies to serving customers in high-cost regions. Stated directly, in a competitive market, policymakers should be cautious about relying on internal-company cross-subsidized systems and analyses to construct support mechanisms to serve high-cost, low density regions. This commentary highlights the importance of defining high-cost regions, understanding the financial requirements, and establishing the appropriate policy systems. The changing environment can quickly create policy risks.

Summary comments

This third section has provided a brief history of USF programs in order to provide a better context for understanding the evolution of universal service support and the likely reformulations of USF support that must occur in the future. As the previous sections of this White Paper demonstrated, provision of affordable "supported services" to all consumers, even with USF support, can be a tenuous economic proposition. In addition, it was also represented that, in rural exchanges, there are areas of profitability (population clusters or Town Centers) and areas where providing "supported services" appears to be uneconomic. The historic formulation of universal service was that these uneconomic regions would be supported through a combination of implicit internal cross-subsidization (from more profitable services and service regions) and explicit USF receipts. In the past, the sources of profits for internal cross-subsidization (long distance, business services, urban residential) consistently have been targeted by competitive entry that erodes profitability and eliminates the potential for continuing implicit support. The data in this White Paper indicate that this trend of competitive entry targeting pockets of profitability is continuing, with the rural cluster (or Town Center) as the latest target. As these sub-wire center regions face accelerating competition, incumbent carriers saddled with POLR obligations will be left with an increasing percentage of their business dedicated to serving uneconomic regions (in Wall Street terms, a "negative mix shift") that can no longer be internally supported or justified based on cross-subsidization. The financial ramifications for incumbents could be severe. As this evolution occurs, the need for explicit support mechanisms such as federal USF and TUSF will increase if service at reasonable rates is to continue to these outlying customers. Therefore, in this environment of targeted competition, the authors propose that policymakers must begin to view explicit support mechanisms as providing critical consideration for the incumbent POLR carriers to engage in otherwise economically irrational activities in order to advance the policy goals of ubiquitous service to consumers at reasonable rates. Without this consideration, carriers cannot be expected to assume, and should not be required to assume, costly POLR obligations.

[36] *See* Reply Comments of the New York State Telecommunications Association, Inc. and Balhoff & Rowe, LLC, *Proceeding on Motion of the Commission to Examine Issues Related to the Transition to Intermodal Competition in the Provision of Telecommunications Service, Case 05-C-0616; October 28, 2005*], pp. 11-16; note especially on p. 13, where Verizon's telephone operations in all of New York State reported that its operating margin was positive in the year 2000, but progressively deteriorated because of competition to -25.6% in 2003, and only improved to -15.0% in 2004 *because the company cut its operating expenses 11.0% year-over-year even as revenues slipped by another 2.9%*.

Part IV: Policymakers' Choices – Must Be Grounded in Financial Realities

Texas policymakers have initiated an inquiry to identify and decide about constructive options regarding the State's universal service program. The inquiry is very appropriate since rural communications consumers--and the companies that serve them—depend on policymakers making informed policy choices that are grounded in financial reality.

This White Paper makes two fundamental points. First, there continue to be high-cost properties that are reliant on USF support, and the need for that support does not appear to have been diminished. The second point relates to the changing competitive patterns, as the financial data presented in this White Paper indicate that positive returns on investment in rural regions are concentrated in certain denser geographic areas, competitors rationally are targeting the economic service areas, and, as a result, opportunities for an incumbent company to rely on internal cross-subsidizations are eroding rapidly.

This White Paper makes two fundamental points. First, there continue to be high-cost properties that require USF support. Second, changing competitive patterns can rapidly erode an incumbent's ability to rely on internal cross-subsidies.

Financial framework

If the analysis in this White Paper is correct, Texas policymakers will soon be required to decide about new systems or enhancements to existing explicit systems to maintain ubiquitous affordable telecommunications services or to advance those services if broadband capabilities are judged as essential in the future. In this more competitive landscape, it appears that it will be increasingly problematic for policymakers to require telecommunications companies to absorb the risk where USF is not properly targeted to true high-cost regions and to incur anticompetitive harm through absorbing losses in uneconomic regions. Instead, policymakers should do everything possible to ground their policy decisions in a framework that incorporates demonstrable financial realities in order to achieve sustainable solutions that accomplish policy goals while avoiding uneconomic consequences for service providers. The framework of financial realities includes:

1. **High operating and investment costs to serve low-density customers will continue to require financial support.** Economic and social benefits associated with ubiquitous voice and data products will be at risk if USF is reduced or eliminated in uneconomic regions.

2. **The system of universal service support in the future will likely be at least—and possibly primarily—concentrated in regions where incumbents and competitors cannot make a rational case to build and operate infrastructure.** Disaggregation will prove to be a necessary mechanism to match regions that are by nature non-competitive with the USF receipts. The new system, however, will likely be complex in design as it involves decisions about whether one carrier or possibly two carriers (e.g., a supplier with a path to providing high-speed data services and a wireless provider) should be supported. However, the

concentration of support monies in truly high-cost areas should reduce today's problems of arbitrage where many carriers receive funding under a system that averages high and low-cost regions.

3. **High-cost USF should be viewed as financial "support" for the networks serving customers in uneconomic regions—systems should target explicit support to otherwise uneconomic properties to make services available and affordable.** Policymakers should recognize that rational carriers will be pressured (in terms of their fiduciary obligations) to avoid investment in specific regions with negative or "insufficiently-supported" returns on investment, i.e., where expected ROI is less than the carrier's cost of capital. Implicit support through a company's internal cross-subsidizations is unsustainable. While the current system uses averaging mechanisms across individual exchanges—or, in the federal case, across study areas—such an approach is already or will soon prove unsustainable, and should be branded as an anticompetitive practice that harms the incumbent POLR provider and, importantly, puts at risk long-term benefits to the rural consumers.

4. **If policymakers assign insufficient policy-based support, they should understand the risks to policy, customers and carriers.** Diminishing/eliminating support should relieve carriers of the obligation to serve customers in high-cost regions—putting customers at risk of losing basic telephony, and in the future, advanced IP-based services. The doctrine expressed in the previous section is that USF is "consideration" offered to provide specific services in uneconomic regions. Without such funding, the carrier should not be obligated to serve in uneconomic regions. The principle is one of equity, but it also practically drives home the importance of the policy decisions, as the policymakers cannot eliminate support to uneconomic levels *and* expect the carrier to absorb POLR responsibilities. There are consequences for consumers and for other carriers that rely on a POLR-provider if bad policy decisions are made.

5. **Policymakers should consider the value of a platform on which tomorrow's services might be built as they today craft requirements in uneconomic regions, if ubiquity and affordability are assumed to be policy goals.** The legacy USF system has set as its goal high-quality voice communications services, within a framework of comparable and affordable telecommunications products. The Telecom Act of 1996 provided the opportunity for expanding the definition of universal services, as urban communities benefit from an expanded set of communications products. To this point, broadband has not yet been defined as one of those comparable services, but the growth in broadband makes it a serious candidate for inclusion within the next three to five years. In fact, universal service policy that does not consider the path to the future appears to be short-sighted. The Federal Communications Commission has clarified that support may go to networks capable of supporting multiple services, including broadband. In fact, a number of municipalities in rural regions have considered whether they should incur tax-payer support for municipal broadband because of the importance of the products—which is nothing less than a variation on universal service support. Policymakers should consider whether USF payments today provide the necessary platform for likely developments which would include broadband products that are comparable and affordable.

Four general approaches

It is proposed that there are four general approaches that Texas policymakers might choose.

- **Leave the program unchanged.** It might be decided that the fund has been successful and whatever benefits might be derived from changes to the system are too minor to risk altering the Texas program. In short, TUSF has succeeded in achieving goals to provide ongoing services in high-cost regions. Further, the uncertainty related to the federal reform process is such that not all of the relevant information is available to Texas policymakers. In this scenario, the model, payments and monitoring systems might be maintained until a date established to further review the program in the context of federal reform.

- **Reduce or raise the level of funding.** The funding mechanisms might be left fundamentally unchanged—that is, the funds might be distributed in the same way as they are at present—on the basis of embedded costs and HAI models, but the level of funding might be modified. Importantly, the carriers should not be forced to raise rates in competitive regions to offset USF reductions; rate increases should be targeted to non-competitive regions where the rate increases will not have an anticompetitive impact. The two most obvious possibilities are that the funding might be raised or lowered, and there might be some adjustment to rates through extended area calling, higher subscriber line charges or other rate-flexibility. For example, if the PUC were to decide that the State's USF funding should be reduced, it might be determined that $2 per line should be reduced in USF payments, while allowing the local telephone provider to increase retail rates or other charges by the same amount in non-competitive regions. Systemic changes might be possible at a later time, in the wake of the federal reforms or after further State-specific study. The risk in reducing support monies today is that the highest-cost regions appear to be increasingly isolated, again in light of the data in this White Paper, and it is not equitable to require POLR carriers to provide service in high-cost, uneconomic areas if the policymaker is not willing to supply appropriate consideration.

- **Consider re-targeting all or most of the Texas USF to the Out-of-Town regions in light of the findings in this proceeding.** This White Paper highlights systemic concerns. Study area assignments of universal service monies do not appear to be sufficiently targeted in a way that can be sustained. The result is apparently meaningful understatement of the USF monies needed in specific areas, the opportunity for arbitrage in more profitable regions where a competitor can also draw down USF where it is not truly needed, and a system that will fail as competitors win business in more economic clusters and reveal the ongoing problems in intra-company cross-subsidies. The merit in this approach is that the underlying problems begin to be addressed through more immediate programs if specific solutions can be identified quickly.

- **Commit to a more refined study.** It is also realistic to commit to a detailed study, building upon the insights of this White Paper and the insights drawn from other participants in the current proceeding. The problem is that the Texas Legislature is seeking immediate guidance and a study requires more patience. The advantage is that serious and well-constructed modifications might be made to a system that is currently under attack because of its dependence on intra-company allocations.

Regardless of which approach is chosen, the critical factor is that the decision-making process should incorporate the framework described above in order to ensure that solutions are properly grounded in foundational financial realities. If such a framework is not at the core of the deliberations, the decisions made and solutions designed will prove almost certainly ineffective and unsustainable. Attempting to achieve policy goals through approaches that ignore financial realities will serve only to jeopardize those policy goals, in this case placing rural communications customers and their communities at great risk.

Attempting to achieve policy goals through approaches that ignore financial realities will serve only to jeopardize those policy goals over time, in this case placing rural communications customers and their communities at great risk.

Appendix I: Current System of Universal Service: Interstate and Intrastate Obligations

Historically, telecommunications law and policy has been a product of cooperative federalism. Because telecommunications networks are capable of providing both jurisdictionally intrastate services as well as interstate services, dual regulation (i.e., state and federal) is necessary. The same is true today. And nowhere is this combination of state and federal jurisdiction more apparent than in the case of universal service.

Separations and Accounting: The Basics of How Carriers Recover Certain Costs

To fully understand the significance of universal service, it is necessary to have an understanding of how carrier costs and revenues are regulated between jurisdictions. For example, a local call from the Capitol Building in Austin to the University of Texas administration building is a pure intrastate, local call. A call from the Capitol Building in Austin to our Nation's capitol in Washington, DC, is an interstate call. Two types of calls, two types of jurisdiction: one state and one federal. But at least a portion of the facilities used for the two different types of calls is exactly the same. The facilities between the handset and the local telephone companies' switching equipment (known as the local loop) are used for both calls. In a regulated industry like telecommunications where costs must be allocated between state and federal jurisdictions, a problem exists because, as in the example above, some of the same facilities are used for jurisdictionally different types of calls.

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In *Smith v. Illinois Bell Telephone Co.*, the United States Supreme Court addressed the problem, and required telephone companies to conduct some type of "apportionment," allocating part of their costs for commonly used facilities (e.g., the local loop) to an interstate cost basket and part of its costs for common facilities to an intrastate cost basket.[37] Shortly after *Smith*, Congress passed the Communications Act of 1934.[38] In an acknowledgement to *Smith*, Section 221(c) of the 1934 Communications Act gives the FCC the authority to classify the property of any wireline telecommunications company "as used in interstate or foreign telephone toll service." The property not deemed interstate would thus be considered intrastate. And with that, the vast and complex world of telephone separations was born.

Before classifying property as interstate pursuant to Section 221(c), the FCC is obligated by statute to consult the state in which the property is located.[39] A Federal-State Joint Board on Separations exists as a mechanism by which states are consulted with respect to separations issues. In addition to the jurisdictional separation of a telecommunications carrier's costs, both federal and state regulators "have traditionally gone through countless additional stages of cost slicing, chopping and dicing."[40] More specifically, regulators have required telecommunications carriers to allocate costs and revenues between regulated and unregulated services. In adding another layer of complexity to separations, regulated costs must then be distinguished between traffic sensitive costs and non-traffic sensitive costs.

[37] 282 U.S. 133 (1930).
[38] *See* 47 U.S.C. §§ 151 et. seq.
[39] 47 U.S.C. §221(c).
[40] Peter W. Huber, Michael K. Kellog, and John Thorne, (*Federal Telecommunications Law)* 2.2.2.4 (2d ed. Aspen L. & Bus. 1999)

In 1947, the FCC together with the National Association of Regulatory Utility Commissioners (NARUC) developed a separations manual designed to help carriers allocate costs between federal and state rate bases.[41] Separations underwent a series of revisions until the FCC froze the interstate allocation factor at twenty-five percent in 1986.[42] Today, the jurisdictional and cost separations procedures are set out in Title 47, Chapter 36 of the Code of Federal Regulations.[43]

Jurisdictional and cost separations are significant for several reasons. Most importantly, separations establish the costs, *including direct operating costs and implicit support,* for intrastate and interstate services, allowing state regulators to set local rates for end users based on either a rate of return or price cap mechanism. The separations mechanisms allow the FCC to determine the carriers' interstate costs/support so that rates could be set for interstate services, such as switched and special access.

The separations approach also has a direct impact on the carriers' universal service funding. Since universal service is designed to allow certain carriers to recover defined costs, the process of separations enables those carriers to know whether specific costs should be recovered from either state or federal universal service support mechanisms. A change in the separations process would affect cost allocations for carriers, and thus potentially shift cost recovery from the interstate support mechanism to the intrastate support mechanism or *vice versa.*[44] Further, the 1996 Telecom Act requires that the FCC and states "establish any necessary cost allocation rules, accounting safeguards, and guidelines to ensure that services included in the definition of universal service bear no more than a reasonable share of the joint and common costs of facilities used to provide those services."[45]

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Consultation with the states is mandated by the FTA, including in the application of universal service. The judicial process has further clarified the collaborative obligation, notably in *Qwest I*, where the Tenth Circuit stated that the FCC had failed in its *Ninth Report and Order* "to provide any inducements for the state mechanisms that it concedes are necessary to implement universal service" and that the FCC "did not explain how this funding mechanism will interact with other universal-service programs."[46] The court was clear in *Qwest I*:

> *We recognize that the FCC may not be able to implement universal service by itself, since it lacks jurisdiction over intrastate service. See 47 U.S.C. § 152(b). Indeed, the Fifth Circuit has held that the FCC may not consider intrastate revenues in assessing a carrier's contribution to the federal universal-service support mechanism. TOPUC, 183 F.3d at 447-48. It would be impossible for the FCC alone to ensure reasonably*

[41] *Federal Telecommunications Law* §6.2.1.1. Traffic sensitive costs are more easily allocable depending on the nature of a call—i.e., intrastate versus interstate.
[42] *Id.*
[43] To track the unique jurisdictional and cost separations issues associated with regulated telecommunications companies, Congress requires by statute that telephone companies utilize the uniform system of accounts, "an historical financial accounting system which reports the results of operational and financial events in a manner which enables both management and regulators to assess these results within a specified accounting period." See 47 U.S.C. §§154, 219-220 and Title 47, Chapter 32.
[44] The Federal-State Joint Board on Separations is currently investigating the need to extend the current separations freeze in light of advanced services that have been deployed in recent years. The FCC may seek comment on either extending the freeze or by seeking comment and modifying the current way in which carrier costs are separated.
[45] 47 U.S.C. 254(k).
[46] *See In the Matter of Federal-State Joint Board on Universal Service,* , FCC 99-306, CC Docket No. 96-45, *Ninth Report & Order and Eighteenth Order on Reconsideration*, (rel. Nov. 2, 1999) (hereinafter referred to as *Ninth Report and Order*); *Qwest Commun.. Intl.. v. FCC*, 258 F.3d 1191, 1201 (10th Cir. 2001) (hereinafter *Qwest I*).

comparable rates in urban and rural areas unless it were willing to commit massive federal support toward ensuring that rates in rural areas are no higher than those currently in place in urban areas.

The Telecommunications Act plainly contemplates a partnership between the federal and state governments to support universal service. See, e.g., § 254(b)(5) ("There should be specific, predictable and sufficient Federal and State mechanisms to preserve and advance universal service."); § 254(f) ("Every telecommunications carrier that provides intrastate telecommunications services shall contribute, on an equitable and nondiscriminatory basis, in a manner determined by the State to the preservation and advancement of universal service in that State."); § 254(k) (placing complementary duties on the FCC and the states "to ensure that services included in the definition of universal service bear no more than a reasonable share of the joint and common costs of facilities used to provide those services."); see also TOPUC, 183 F.3d at 424 ("[T]here is substantial support in the statute for a dual regulatory structure in the administration of the universal service program."). Thus, it is appropriate - even necessary - for the FCC to rely on state action in this area. We therefore reject Qwest's argument that the FCC alone must support the full costs of universal service. Although § 254(e) requires federal support to be explicit and § 254(k) prevents carriers from using non-competitive services to provide implicit subsidies for competitive services, we see nothing in § 254 requiring the FCC broadly to replace implicit support previously provided by the states with explicit federal support.(12)

Nevertheless, the FCC may not simply assume that the states will act on their own to preserve and advance universal service. It remains obligated to create some inducement - a "carrot" or a "stick," for example, or simply a binding cooperative agreement with the states - for the states to assist in implementing the goals of universal service. For example, the FCC might condition a state's receipt of federal funds upon the development of an adequate state program, an approach the FCC at oral argument conceded was possible. The FCC's fundamental error is in concerning itself only with "enabling reasonable comparability among states." Ninth Order ¶ 38. But § 254 requires a comparison of rural and urban areas, not states. The FCC wishes to take credit for the states' actions in achieving reasonable comparability, but to do so it must also undertake the responsibility to ensure that the states act. On remand, the FCC is required to develop mechanisms to induce adequate state action.[47]

The FCC responded to the Tenth Circuit ruling in *Qwest I* with the FCC's Order on Remand in October 2003, which included a rate review to induce states to achieve reasonably comparable rates; state certification that basic service rates in their rural, high-cost areas served by non-rural carriers are reasonably comparable to a national urban rate benchmark or explanations about why those rates are not comparable; and additional input on targeted mechanisms.[48] In *Qwest II*, the Tenth Circuit noted that it found that the FCC's new certification process satisfied the issues concerning inducements.[49]

The Rise of Implicit Cost Recovery Mechanisms

Prior to the divestiture of AT&T in 1982[50], the national telephone monopoly had developed its own complex set of implicit cost recovery mechanisms to ensure access to affordable, quality telephone service. The cost recovery mechanisms (some of which still exist today) were largely "implemented at the state level and designed to shift costs from rural to urban areas, from residential to business customers, and from

[47] *Qwest I*, 258 F.3d at 1203 – 1205.
[48] *In the Matter of Federal-State Joint Board on Universal Service,* FCC 03-249, CC Docket No. 96-45, Order On Remand, Further Notice Of Proposed Rulemaking, And Memorandum Opinion And Order, 18 FCCR 22559, (rel. October 27, 2003) (hereinafter the *Order on Remand*).at ¶ 4.
[49] *Qwest Commun. Intl., Inc. v. FCC*, 398 F.3rd 1222 (10th Cir. 2005) (hereinafter *Qwest II*).
[50] *See U.S. v. AT&T*, 552 F.Supp. 131 (D.D.C. 1982).

local to long distance services."[51] As explained earlier, the urban-to-rural subsidy was accomplished largely through geographic rate averaging. The result of state requirements that local telephone rates be averaged across a state was that high-density, urban areas, where costs were and are generally lower, was a subsidization of low-density, rural areas where investment and operating costs are usually higher.[52] Further, most states created pricing rules by which businesses pay more for phone service than do residential consumers, even though the costs of providing such services may be the same.[53] Telephone companies have also traditionally charged above costs for unregulated, vertical features like call waiting to help support their high-cost operations.[54] It generally is assumed that any remaining intra-company implicit supports will soon disappear with the advent of competition.

The urban-to-rural subsidy was accomplished largely through geographic rate averaging.

Through the combination of cross-subsidizations—geographic rate averaging, support for residential lines via business lines, and access charges—local telephone companies were able keep all residential rates affordable, even for consumers in high-cost areas. As summarized above, the divestiture of AT&T in the early 1980s and the emergence of competitors in the long distance market, such as MCI, forced the FCC to overhaul its long distance-to-local cost recovery scheme.[55] As part of divestiture, the local Bell Operating Companies were required to file switched and special access tariffs that were "cost based and equal for all carriers."[56] The costs in the tariffed switched access rates included both the actual costs of originating and terminating traffic toll on their local networks and fixed line costs.[57] Fixed line costs associated with a carrier's facilities are those costs that are not traffic-sensitive (e.g., the local loop). In addition, local telephone companies were allowed to recover a portion of their interstate, fixed costs directly from end-users in the form of a subscriber line charge (SLC).[58] In 1984, the SLC was capped at $6.00 per line per month for business lines and $3.50 per line per month for residential lines.[59]

One problem with the approach of allowing LECs to recover a portion of their fixed costs through switched access charges was that certain LECs serving very high-cost areas would have to set their switched access charges at a rate several multiples higher than the rates set for LECs serving low-cost areas, potentially creating sharp differences in the amount charged to long-distance carriers for originating and terminating toll calls. To resolve this problem and help keep switched access charges at least relatively uniform among local telephone companies (and thus predictable for long-distance carriers), the FCC implemented a pooling mechanism by which high-cost LECs would be able to fully recover the costs allowed to them through switched access rates.

[51] Federal Telecommunications Law § 6.2 *citing In the Matter of Federal-State Joint Board on Universal Service*, , FCC 97-157, CC Docket No. 96-45, Report and Order, 12 FCCR 8776, 8784 ¶ 10 (rel. May 8, 1997) (hereinafter referred to as the *First Universal Service Order*).
[52] *First Universal Service Order* at ¶ 11. The FCC also adopted a policy of geographic rate averaging for switched access charges, requiring that long distance carriers pay generally the same switched access charge rate throughout a geographic area.
[53] *Id.*
[54] *Id.*
[55] Federal Telecommunications Law § 6.2.1.2.
[56] *Id.*
[57] *Id.*
[58] *See In the* matter *of MTS and WATS Market Structure* CC Docket No. 78-72, Memorandum Opinion and Order,, 49 Fed. Reg. 7810, 7812-7813 (rel March 2, 1984) (hereinafter *MTS and WATS Order*).
[59] *Id.* The SLC varied in amount for Centrex lines and private line or special access lines.

As part of the pooling process, all LECs pay into the "pool" the amounts they collect from SLCs and interstate switched access charges. The pool administrator, which is the National Exchange Carrier Association (NECA), then distributes the funds needed by each carrier to fully recover its non-traffic sensitive interstate costs. NECA determines the switched access rates that carriers can charge on a regional basis based on estimates of the costs the LECs will need to recover. NECA also files interstate access tariffs on behalf of small local exchange carriers. While participation in the NECA pool is voluntary today, most small and rural carriers still elect to participate in the NECA pool process.

Beginning in 1983, NECA estimated LEC costs based on actual and projected interstate switched access minutes of use, but the task is truly daunting based on the sheer numbers involved. Over time, the growing number of long-distance companies contended that they were bearing too much of the burden of supporting the LECs' high-cost areas in the form of access rates. In response to those criticisms, the historical, implicit cost recovery mechanisms were further modified in the wake of the passage of the 1996 Telecommunications Act, notably in the CALLS Order in May 2000 and in the MAG Order in October 2001 (implemented in July 2002.)[60]

The Universal Service Provisions of the 1996 Telecom Act

The 1996 Telecom Act mandated many fundamental changes to the telecommunications industry. One of the major changes was in revising universal service, including implicit support mechanisms such as access rates. The FCC therefore implemented over the next six years key reforms in response to the mandates of the Telecom Act, largely dismantling implicit cost recovery mechanisms and replacing them with a more explicit cost recovery scheme. Specifically, section 254(a) of the 1996 Telecom Act required the FCC, in collaboration with a Federal-State Joint Board on Universal Service, to develop an explicit mechanism to augment or replace a system that had evolved, and to do so within a mere fifteen months from the date of enactment of the legislation.[61] In implementing the mandates of the Telecom Act, the FCC and Joint Board were required to follow a set of specific statutory objectives, including:

1) Quality services should be available at just, reasonable and affordable rates;

2) Access to advanced telecommunications and information services should be provided in all regions of the nation;

3) 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;

4) All providers of telecommunications services should make an equitable and nondiscriminatory contribution to the preservation and advancement of universal service;

[60] *See In re Access Charge Reform*, 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, 15 FCCR 12962 ("CALLS Order") and *Multi-Association Group (MAG) Plan for Regulation of Interstate Service of Non-Price Cap Incumbent Local Exchange Carriers and Interexchange Carriers*, CC Docket No. 00-256, Second Report and Order, Federal-State Joint Board on Universal Service, CC Docket No. 96-45, Fifteenth Report and Order, Access Charge Reform for Incumbent Local Exchange Carriers Subject to Rate-of-Return Regulation, CC Docket No. 98-77, Report and Order, Prescribing the Authorized Rate of Return for Interstate Service of Local Exchange Carriers, CC Docket No. 98-166, Report and Order, 16 FCCR 19613 (2001) ("MAG Order").
[61] *See* 47 U.S.C. 254(a)(1).

5) There should be specific, predictable and sufficient Federal and State mechanisms to preserve and advance universal service; and

6) Elementary and secondary schools and classrooms, health care providers, and libraries should have access to advanced telecommunications services.[62]

The 1996 Telecom Act defined statutory principles for USF, including the requirements that the funding should specific, predictable and sufficient to ensure the preservation and advancement of ubiquitous, affordable, and advanced telecommunications services.

In addition to the statutory principles, Congress gave the FCC and the Joint Board the authority to adopt other principles "for the protection of the public interest, convenience and necessity" that are consistent with the 1996 Telecom Act.[63] One such additional principle recommended by the Joint Board and adopted by the FCC, was the principle of "competitive neutrality . . . upon which we base policies for the preservation and advancement of universal service."[64] Consistent with the Joint Board's recommendation, the FCC defined competitive neutrality to mean that universal service support mechanisms and rules neither unfairly advantage nor disadvantage one provider over another, and neither unfairly favor nor disfavor one technology over another.[65]

To a large extent, the competitive neutrality principle has come to mean that universal service support is "portable" or can be "carried over" to competitors authorized to provide universal service. For example, if two carriers serve the same service territory, and LEC A currently serves an end user customer residing in a high-cost area and receives universal service support to help recover its costs of providing service to that customer, when LEC B "wins" one of the customers of LEC A, LEC B now receives the support LEC A was previously receiving when it provided service to the end user. The USF paid to LEC A is lost and portable over the LEC B.

On May 8, 1996, the FCC released its *First Universal Service Order*, acting on many of the recommendations of the Federal-State Joint Board on Universal Service. The *First Universal Service Order* established rules that . . .

Defined supported services,

Replaced existing implicit federal cost recovery,

Established funding methods for schools, libraries and rural health care providers, and

[62] 47 U.S.C. § 254(b).
[63] 47 U.S.C. § 254(b)(7).
[64] *First Universal Service Order* at ¶ 46. In addition to adopting the principle of competitive neutrality, the FCC also adopted the Joint Board's recommendation for a principle of "technological neutrality," as well. The concept of "technical neutrality" does not guarantee the success of any technology supported through universal service support mechanisms, but merely provides that universal service support should not be biased toward any particular technologies. *First Universal Service Order* at ¶ 49.
[65] *First Universal Service Order* at ¶ 47.

Mandated the contribution methodology and which types of carriers were required to make contributions.[66]

In implementing the transition from an implicit support mechanism to an explicit support mechanism, the FCC decided on a gradual approach, phasing out implicit cost recovery (i.e., switched access charges) over a period of years and replacing it with an explicit universal service fund. In the *First Universal Service Order*, the FCC temporarily appointed NECA to administer the new universal service fund, and asked a Federal Advisory Committee to appoint a permanent administrator.[67] The FCC eventually appointed a single administrator, which was the Universal Service Administrative Company—a not-for-profit corporation wholly-owned by NECA.[68]

As for phasing out implicit mechanisms and replacing them with an explicit fund, the FCC focused on interstate access charges, and more specifically on the carrier common line charge, which was the portion of the switched access charge designed to allow carriers to recover a portion of their fixed line costs. As a companion item to the *First Universal Service Order,* the *First Access Charge Reform Order*—released at the same time as the *First Universal Service Order*—established a plan whereby the carrier common line charge would be reduced in increments and eventually eliminated.[69] To ensure revenue-neutrality, the FCC determined that the access revenue "lost" in this reform would be recovered through SLC increases imposed gradually on end-users (generally rising from levels of $6.00 and $3.50 per month for businesses and residences, respectively, to ($9.20 and $6.50, respectively).[70] Further, the Order permitted the FCC to assess long-distance carriers a new, flat-rated monthly charge called the primary interexchange carrier charge ("PICC").[71] The idea behind the PICC changes was to allow LECs to recover their fixed line costs in the manner in which they were incurred, as opposed to allowing them to recover their fixed costs via a traffic-sensitive mechanism (i.e., switched access revenues which vary by usage).

Even with the increase in SLCs and with the new PICC, the FCC recognized that many local exchange carriers were unlikely to be able to fully recover all of their fixed line costs, especially those carriers serving high-cost areas. Accordingly, the FCC continued to allow carriers to assess the carrier common line charge on originating toll calls only to recover their costs.[72] Further, pursuant to the 1996 Telecom Act, the FCC established through USAC other explicit support mechanisms by which LECs could recover their costs of providing services to high-cost areas. The FCC authorized—consistent with Section 254(d) of the 1996 Telecom Act[73]—that all carriers providing interstate telecommunications services should assess their end users a percentage-based surcharge, or a contribution factor, to fund the explicit support

[66] *See, generally First Universal Service Order*.
[67] *First Universal Service Order* at ¶ 774.
[68] Initially, the FCC established three separate entities: USAC, to administer the high cost and low income portion of the fund; the Schools and Libraries Corporation to administer funds for schools and libraries; and the Rural Health Care Corporation to administer funds to rural health care companies. Congress was disgruntled with the FCC's appointment of three separate corporations to administer the fund. The FCC eventually acquiesced to their concerns and named USAC the permanent universal service fund administrator on January 1, 1999. *See* Federal Telecommunications Law § 6.3.2.5.
[69] *In the Matter of Access Charge Reform,* CC Docket. Nos. 96-262, 94-1, 91-213 and 95-725, First Report and Order, 12 FCCR 15982 (rel. May 7, 1997) (hererinafter referred to as the *First Access Charge Reform Order)*at ¶ 77.
[70] The SLC amount for multi-line businesses was increased from $6 per line, per month to $9 per line per month. The SLC amount for single-line businesses and residential customers was increased from $3.50 per line per month, by $1.50 per month for the first year, and $1 per month per year thereafter until it reached $9. *See First Access Charge Reform Order* at ¶ 78.
[71] The PICC for residential lines was initially set at $0.53 per month, $1.50 for non-primary residential lines and $2.75 per line for multi-line businesses. *See First Access Charge Reform Order* at ¶ 99.
[72] *First Access Charge Reform Order* at ¶ 60.
[73] Section 254(d) of the Act requires all telecommunications carriers that provide interstate service to contribute, on an equitable and nondiscriminatory basis to the specific, predictable, and sufficient mechanisms established by the FCC to preserve and advance universal service.

mechanisms.[74] Since the year 2000, the contribution factor has ranged from 5.5% to nearly 11%. Over the last couple of years, the contribution factor has increased steadily as companies offering next generation technologies that are not classified as telecommunications service but which still utilize existing networks, argue they should be exempt from contributing to the explicit fund. The FCC currently has an open proceeding examining possible revisions to the universal service fund contribution methodology.[75]

Even with the increase in SLCs and with the new PICC, the FCC recognized that many local exchange carriers were unlikely to be able to fully recover all of their fixed line costs, especially those carriers serving high-cost areas.

Similar to the manner in which NECA collects, pools and redistributes money to LECs to allow them to recover costs, USAC collects universal service funds from the industry and then distributes those funds to LECs based on actually-incurred costs. LECs receive support from USAC in one of two ways, depending on whether the LEC is classified as a non-rural or rural carrier. USAC is also responsible for distribution of USF to competitive eligible telecommunications carriers, a practice that was implemented in the Universal Service RTF Order in 2001.

Non-Rural Carriers

Non-rural carriers, defined for the purposes of receiving universal service support as those carriers that are not rural according to the terms of the Telecom Act of 1996,[76] recover costs of providing services to rural and high-cost areas based on a forward-looking economic cost model. High-cost model support is distributed at the wire center level and is targeted to carriers serving wire centers with forward-looking costs that exceed the national benchmark of cost per line.[77] In addition to high-cost model support, non-rural carriers also receive interstate access support (IAS), according to a new USF fund element created in the CALLS Order of May 2000 to help offset the FCC mandated reduction of their interstate access charges.[78] The notable insight is that implicit support of approximately $650 million was made explicit, simply shifting some monies from access payments to LECs to USF through the new IAS paid to LECs. The formula was established to replace lost access revenues as rates fell to $0.0055 per minute for the largest LECs. The offset was approximately balanced by the increase in the subscriber line charge *plus* Universal Service increases in the form of the new IAS high-cost USF fund element.

[74] *See First Universal Service Order,* 12 FCCRat 9206-07, ¶¶ 843-44; *Federal-State Joint Board on Universal Service, Access Charge Reform,* Sixteenth Order on Reconsideration and Eighth Report and Order in CC Docket No. 96-45 and Sixth Report and Order in CC Docket No. 96-262, 15 FCCR 1679, 1685, ¶ 15 (1999) (establishing a single contribution for all universal service support mechanisms based on interstate and international revenues).

[75] ***See In the Matter of Universal Service Contribution Methodology,*** WC Docket No. 06-122, FCC 06-94, Report and Order and Notice of Proposed Rulemaking, 21 FCCR 7518 (rel. June 27, 2006) (hereinafter the *Contribution NPRM).*

[76] "Rural telephone company" means a local exchange carrier operating entity to the extent that such entity--(A) provides common carrier service to any local exchange carrier study area that does not include either--(i) any incorporated place of 10,000 inhabitants or more, or any part thereof, based on the most recently available population statistics of the Bureau of the Census; or (ii) any territory, incorporated or unincorporated, included in an urbanized area, as defined by the Bureau of the Census as of August 10, 1993; (B) provides telephone exchange service, including exchange access, to fewer than 50,000 access lines; (C) provides telephone exchange service to any local exchange carrier study area with fewer than 100,000 access lines; or (D) has less than 15 percent of its access lines in communities of more than 50,000 on the date of enactment of the Telecommunications Act of 1996 (47 U.S.C. Section 153 (37)). The terms Rural Carrier or RTC are meant to incorporate the statutory definition of "rural telephone company" and its application in the FCC rules, adopted pursuant to CC Docket No. 96-45, which set a separate schedule and additional scrutiny for "rural telephone companies," May 8, 1997 Decision, ¶ 96. FCC Public Notice CC Docket No. 96-45, DA 98-1205 (released June 22, 1998) lists recognized self-certified "Rural Telephone Companies."

[77] 47 C.F.R. § 54.309. This regulation details how the national benchmark is calculated. *See supra*, for an explanation of the litigation surrounding the calculation and determination of the national benchmark.

[78] 47 C.F.R. § 54.800 et. seq.

Ninth Report and Order

In the *Ninth Report and Order* the FCC defined more specifically the high-cost universal service support mechanism for non-rural LECs based on their forward-looking economic costs. The forward-looking cost model begins with a determination of statewide average forward-looking costs for all non-rural LECs within a state.[79] The statewide averages are then compared to the national average forward-looking costs for all non-rural carriers.[80] If the statewide average is less than 135% of the nationwide average cost, then no explicit high-cost support would be provided to any non-rural carriers.[81] In states where average forward-looking costs exceed the 135 percent benchmark, funding would be provided to non-rural wire centers where costs exceeded that benchmark.[82]

Shortly after its release, Qwest challenged the validity of the *Ninth Report and Order,* arguing that in creating the non-rural mechanism, the FCC failed to explain how its 135 percent nationwide benchmark would help achieve the statutory goals of reasonable comparability and efficiency.[83] The Tenth Circuit Court of Appeals agreed with Qwest and remanded the issue to the FCC.

In response to the Tenth Circuit, the FCC, acting on a recommendation of the Federal-State Joint Board, adopted a rate review and expanded the certification process to induce states to ensure reasonable comparability for rural and urban rates in areas served by non-rural carriers.[84] On February 23, 2005, the Tenth Circuit again remanded this issue to the FCC because it had failed to reasonably define the terms "sufficient" and "reasonably comparable."[85] Accordingly, the court remanded the matter again to the FCC and ordered it to "utilize its unique expertise to craft a support mechanism taking into account all the factors that Congress identified in drafting the Act and its statutory obligation to preserve *and* advance universal service."[86] As a result of the second remand, the FCC released a notice of proposed rulemaking in December 2005, seeking comment on how it should define the terms "sufficient and reasonably comparable," how it should modify the high-cost funding mechanism for non-rural carriers, and whether it should adopt a "non-rural insular mechanism."[87]

The litigation highlights, among other issues, that forward-looking cost models can be problematic. For example, the current FCC Chairman, Kevin Martin, has indicated his concerns about cost models, especially when it comes to universal service issues.[88] The only professional

[79] *See* 47 C.F.R. § 54.309
[80] *Id.*
[81] *Id.*
[82] *Id.*
[83] *Qwest I* , 258 F.3d 1191).
[84] See, generally *Order on Remand.*
[85] See, generally *Qwest II..*
[86] *Qwest II* 398 F.3d at 1237 (emphasis in original).
[87] *Federal-State Joint Board on Universal Service and High Cost Universal Service Support*, CC Docket No. 96-45, WC Docket No. 05-337 (rel. Dec. 9, 2005).
[88] "I questioned whether the Commission's use of forward-looking costs as the basis for distributing universal service support for non-rural telephone companies and would have even greater concerns if such an approach would be used to distribute support to rural companies." *See Statement of Commissioner Kevin J. Martin, Federal State Joint Board on Universal Service*, CC Docket No. 96-45, Order (rel. June 28, 2004). Statement available here: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-254271A1.pdf

economist appointed to the FCC in recent years, Harold Furchtgott-Roth, opposed the use of any type of model for the purposes of recovering universal service costs.[89]

Rural Carriers

Rural LECs, defined in the Telecom Act of 1996 on the basis of a four-pronged test, are allowed to recover their actual, embedded costs of providing service to their high-cost service areas. For example, federal local loop support (generally the most expensive part of rural carriers' plant), is determined by comparing embedded costs for rural carriers with a national cost benchmark. Carriers with costs exceeding the national cost benchmark receive federal support for a portion of their costs. Rural LECs recover their actual costs through a variety of sub-funds within the overall universal service fund. Today, those separate funds include:

Local switching support—designed for those carriers serving less than 50,000 lines to help recover the full extent of their local switching costs;[90]

High-cost loop support—designed for rural rate-of-return and price cap carriers to recover the "last mile" of connection in service areas where the cost to provide this service exceeds 115 percent of the national average cost per line;[91] and

Interstate common line support—designed for rural rate-of-return carriers to recover their interstate common costs to help keep SLCs, paid by end users, low.[92]

In addition to the general categories of cost recovery, rural LECs are also eligible to receive other high-cost funds such as "safety net additive support"[93] and "safety valve support"[94] to help offset the loop costs in extremely high-cost areas. The funds are available for certain local exchange carriers that purchase and invest in new exchanges, as well as for CETCs that receive funding under the rubric of "competitive neutrality" (because a "competing" ILEC is receiving funding).[95]

The mechanisms that apply to rural/non-rural carriers arose, in part, as a result of the work of the Rural Task Force (RTF). In the FCC's *First Universal Service Order*, the Commission set in motion the creation of a rural task force to "identify the issues unique to rural companies and

[89] "As I have indicated previously, the regulation of markets through models is inherently inequitable . . . No economic cost model can meet the "specific and predictable" standard required of the federal universal service support mechanisms by the Act." See Statement of Commissioner Harold Furchtgott-Roth, Federal-State Joint Board on Universal Service; Forward-Looking Mechanism for High Cost Support for Non-Rural LECs, CC Docket Nos. 96-45, 97-160, _____ (rel. Dec. 12, 1998). Prior to becoming an FCC Commissioner, Commissioner Furchtgott-Roth was Chief Economist for the U.S. House Committee on Commerce. He was a Senior Economist for Economists Incorporated from 1988-1995 and, before that, he served as a Research Analyst for the Center for Naval Analyses. He holds an S.B. in Economics from the Massachusetts Institute of Technology and a Ph.D. in Economics from Stanford University.
[90] 47 C.F.R. § 54.301.
[91] 47 C.F.R. § 36.601 et. seq.
[92] 47 C.F.R.§ 54.901 et. seq.
[93] 47 C.F.R. § 36.605
[94] 47 C.F.R. § 54.305(b).
[95] Between January 1, 1998, and July 1, 2004, rural carriers were also entitled to receive long term support to recover any short-comings in cost recovery a carrier would have had with regard to funds collected from the interstate access charge pool. The long term support sub-fund was rolled into the interstate access common line sub-fund (???) in 2004.

analyze the appropriateness of proxy models for rural companies."[96] The RTF issued a series of five White Papers, each elaborating on the unique circumstances of rural LECs in America. After extensive research, the RTF determined that the nationwide average cost per line per month for non-rural carriers was $23.52, while per line per month cost for rural carriers was $59.36.[97] Further, in applying the forward-looking cost model for non-rural carriers developed in the *Ninth Report and Order* to rural carriers, the RTF found that such an application would result in a reduction of more than $1.1 billion in existing cost recovery support for rural carriers.[98] The RTF effectively "proved" the concerns of critics that contended that forward-looking cost models may not estimate correctly the costs associated with providing rural service and therefore would possibly not meet the "specific, predictable and sufficient" support mandates of the 1996 Telecom Act.[99] Indeed, the RTF found that when it ran the FCC high-cost model that "the model results tend to be in the high and low extremes, rather than near the expected results for the area being analyzed."[100] As a result, the RTF concluded and recommended to the FCC, that the non-rural forward-looking cost model "is not an appropriate tool for determining the forward-looking costs of Rural Carriers."[101]

It is important to note that the support payments also create another problem, as explained more fully in **Part III** of this White Paper, when they average across the carrier's entire study area. Support in such a case is spread evenly across all lines served in the rural LEC's study area. As a result, the methodology assumes that the cost to serve customers throughout an entire study area is the same.[102] The RTF examined the topic and suggested that incumbent carriers would favor diasggregation—assigning greater USF to the highest-cost parts of their service region and lesser USF payments to lower-cost properties—so they could target universal service support and prevent "cream skimming of their most lucrative [sic] customers."[103] By the same token, the RTF opined that competitive carriers prefer disaggregation "to develop rational entry strategies and to facilitate portability of support."[104] Accordingly, the RTF examined a variety of disaggregation techniques and submitted to the Joint Board a recommendation that rural carriers should be permitted to disaggregate and target federal universal service support to smaller and more specific regions within their study areas.[105] Accordingly, the RTF recommended, and the FCC adopted, a methodology by which rural carriers would be allowed to proceed down one of three paths to calculate costs to receive high-cost support.[106]

[96] *First Universal Service Order* at ¶ 253.
[97] *A Review of the FCC's Non-Rural Universal Service Fund Method and the Synthesis Model for Rural Telephone Companies (White Paper 4)*, Rural Task Force, September 2000 (hereinafter referred to as *White Paper 4)* at p. 6.
[98] *Id.*
[99] *See* 47 U.S.C. § 254(b)(5).
[100] *White Paper 4* at p. 10.
[101] *Id.*
[102] *Disaggregation and Targeting of Universal Service Support,* White Paper 6, Rural Task Force September 2000 (hereinafter referred to as White Paper 6) at p. 5.
[103] White Paper 6 at p. 6.
[104] *Id. See also* Letter from William R. Gillis, Chair, Rural Task Force, to Magalie Roman Salas, FCC, dated Sept. 29, 2000 ("Rural Task Force Recommendation").
[105] The methods of disaggregation examined by the RTF included the use of proxy models, concentric circles, actual costs, long run incremental cost studies, density and other cost factors, and self-certification. White Paper 6 at pp. 6-10
[106] "Path One" would allow LECs to certify to their state commission that they do not want to disaggregate their federal support. LECs would remain on Path One until 1) the state commission having jurisdiction over the LEC implements a disaggregation plan below the study area level; 2) a change in state or federal law requiring disaggregation; or 3) a change in ownership of the LEC. "Path Two" would be for those LECs that want state commission review and approval of a disaggregation plan. "Path Three" would permit carriers to self-certify a disaggregation plan with a state commission. LECs opting for "Path Three" had to comply with certain requirements, including: 1) disaggregation would have to occur at the wire center level or into no more than two "cost zones" per wire center; 2) if a state commission had adopted a disaggregation plan, then the carrier must certify that its disaggregation plan complies with the state's plan; 3) the carrier's disaggregation plan must reasonably relate to the way costs are incurred within the disaggregation zones; and 4) if the plan uses a benchmark to determine support amounts, the benchmark must be consistent with how the total study area level of support is derived. *Federal-State Joint Board on Universal Service, Multi-Association Group (MAG) Plan for Resolution of Interstate Services of Non-Price Cap Incumbent Local Exchange Carriers and Interexchange Carriers*, CC Dockets Nos. 96-45 and 00-256, Fourteenth Report and Order, Twenty-Second Order on Reconsideration, and Further Notice of Proposed Rulemaking (rel. May 23, 2001) ("*RTF Order*") at ¶¶ 137-164.

In adopting the RTF's recommendation, the FCC found that giving rural carriers the flexibility to disaggregate their USF payments based on one of three disaggregation paths reflects the unique characteristics of LECs serving rural areas and that a "one size fits all" approach would be inappropriate.[107]

While many carriers elected one of the two disaggregation paths, the majority of carriers chose not to disaggregate. There appear to be two primary reasons. First, carriers were given less than one year to elect a disaggregation plan, a daunting task for many small, rural carriers.[108] Designing a plan on its own or working with a state commission to implement a two zone per wire center plan is a resource-intensive endeavor which many carriers were unable to implement. Second, rural towns generally were not experiencing the same levels of competition in 2001-2002 as they are today. The cost and complexity of disaggregation likely were less justified at that time than they are today. This White Paper provides empirical and policy support for greater targeting, commends Texas for targeting support to the wire center level (as opposed to the study area level), and suggests that the time is right to consider even further disaggregation.

Scope of Services Eligible to Receive Federal Universal Service Funding

One major political and practical concern with any universal service program—whether federal or state—is fund size. Currently, the Federal universal service fund is estimated to be about $7 billion for 2006.[109] Congress recognized the growth in fund size likely would be a concern and established a process whereby the scope of service for which universal service funds could be used was limited. But the Telecom Act also states that "universal service is an evolving level of telecommunications services,"[110] whereby the FCC and the Joint Board are authorized to conduct examinations of which services should be supported. Accordingly, the Joint Board and FCC have examined the services eligible for support since the release of the *First Universal Service Order*. The FCC adopted the most current definitions in 2005, which are the following:[111]

1) Voice grade access to the public switched network;

2) Local usage;

3) Dual tone multi-frequency signaling or its functional equivalent;

4) Single party service or its functional equivalent;

5) Access to emergency services;

6) Access to operator services, interexchange services and directory assistance; and

[107] *RTF Order* at ¶146.
[108] The *Rural Task Force Order* was released on May 23, 2001. Carriers had to submit disaggregation plans by no later than May 15, 2002. *See* 47 C.F.R. §54.315(a).
[109] *See* http://www.universalservice.org/about/universal-service/fund-facts.aspx.
[110] 47 U.S.C. § 254(c)(1).
[111] In the Matter of Federal –State Joint Board on Universal Service, CC Docket No. 96-45, Report and Order (rel. March 17, 2005).

7) Toll limitation for qualifying low income consumers.[112]

An eligible telecommunications carrier must offer each of these services in order to receive federal universal service support.[113] The FCC was prohibited from acting on one of the Joint Board's recommendations regarding scope of supported services by an act of Congress, which limited support to only one, primary line. In February 2004, the Joint Board had recommended to limit the scope of high-cost support to a single connection that provides access to the switched network. The intent was to control the overall size of the USF. In effect, the recommendation would have limited carriers in high-cost areas to support for one telephone line per premise. On December 8, 2004, Congress passed the 2005 Consolidated Appropriations Act, which prohibited the FCC from "modify[ing], amend[ing] or chang[ing] its rules or regulations for Universal Service support payments to implement the February 27, 2004, recommendations of the Federal-State Joint Board on Universal Service regarding single connection or primary line restrictions on universal service support payments."[114] In effect, Congress reinforced its commitment to the scope and principle of providing telecommunications services in high-cost regions. While fund growth is a concern, it is not the Congressional intent that rural regions should be deprived of the monies to support communication network services.

Eligibility: Determining Carrier Qualifications for Receiving Support

To be eligible to receive federal universal service dollars, carriers must be designated as an eligible telecommunications carrier ("ETC") by either the FCC or the state utility commission in the state in which the carrier providers service.[115] Acting upon a recommendation of the Joint Board, the FCC provided guidelines for those states looking for a framework to adopt ETC standards. Those guidelines include:

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;

Demonstration of the carrier's ability to remain functional in emergency situations;

Demonstration that the carrier will satisfy consumer protection and service quality standards;

The ability to offer local usage plans comparable to those offered by the ILEC in the areas for which it seeks designation; and

An acknowledgement that the carrier may be required to provide equal access if all other ETCs in the designated service area relinquish their designations pursuant to § 214(e)(4) of the Act.[116]

[112] 47 C.F.R. § 54.101(a).
[113] 47 C.F.R. § 54.101(b).
[114] *See Consolidated Appropriations Act* at § 635.
[115] 47 U.S.C. § 214(e).
[116] *In the Matter of Federal-State Joint Board on Universal Service,* CC Docket No. 96-45, Report and Order (rel. March 17, 2005) (hereinafter referred to as the *FCC's ETC Order)* at ¶ 2.

Some states do not have an authorizing statute or other legal authority to designate ETCs. To the extent that states lack such jurisdiction, the FCC will review a carrier's request for ETC status under the criteria outlined above. [117]

Summary of Federal Universal Service Support

Federal universal service support has many facets. The high-cost fund, which is the specific concern of the Texas PUC, began and has continued as a cost-recovery mechanism for high-cost properties. The amount of support that a carrier, and more recently an incumbent ETC, receives from the federal fund starts with the incumbent's verifiable costs. The history of the program and certain aspects of the program today are founded on jurisdictional cost separations, a complicated process in allocating those incumbent costs to federal or state jurisdictions. Those jurisdictional allocations were once entirely implicit—cross-subsidizations within a monopoly, and access charges paid by long-distance carriers. Over time, and more recently because of the Telecom Act of 1996, those implicit payments were made explicit both at the federal and state levels. After the 1996 Telecom Act, two distinct mechanisms were set up to provide carriers with statutorily mandated explicit high-cost support: one for rural carriers and one for non-rural carriers. The Joint Board and the FCC have reviewed the services eligible to receive support and the eligibility criteria for carriers providing such support.

Notably, universal service policy and systems at the federal level have evolved through statutes, regulatory proceedings and judicial decisions that are not easy to summarize. At the same time, the thread appears relatively clear that policy and systems have supported affordable, ubiquitous telecommunications services through systems that respond to the developing marketplace. The theory appears straightforward—that customers must be served and that systems must be designed to support service where network costs are prohibitively high.

Universal service policy becomes even more complex when examining how the federal mechanisms interplay with state statutes and rules relating to universal service. **Part III** in this White Paper summarized the public policy commitment made by Texas in creating its complementary rules—many of which were developed contemporaneously with federal rules.

[117] 47 C.F.R. § 54.201.

Appendix II: Brief History of Federal USF

This White Paper assumes that Universal Service is an important federal mechanism that has evolved successfully over time. This section provides a brief synopsis of that development process, which is instructive in a White Paper that considers further evolutions of the Texas Universal Service system.

Early Formation

Universal service, as a concept, is often wrongly credited to Theodore Vail, AT&T's CEO, who referenced "universal service" in the company's Annual Report of 1907 and in subsequent Annual Reports as a goal in reconciling incompatible phone systems that appeared in the wake of the 1894 expiration of the Bell telephone patents.[118] His comments reflected on the condition of early 1900s' competitive markets that suffered from and usually promoted incompatible telephone services.

As many texts highlight, AT&T and other independent telephone companies were free to compete in the 1890s and the early 1900s, without governmental support payments or significant policy intervention. The networks grew rapidly when AT&T and thousands of independent companies competed on the basis of the number of customers they enrolled, the prices they charged, the quality of the services provided, and their out-of-region customer connectivity. In many of the larger markets, there were dual, redundant networks which required some businesses to purchase two services to have access to their customers. Various excellent academic studies point out that, in these initial decades of competitive service, network growth in rural as well as in urban areas occurred at rapid rates.[119] And, in certain rural regions, as some commentators report, the cost of service was relatively lower than in urban areas because the infrastructure costs were modest and the services more limited.

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In that formative period, the telephone companies were free to charge whatever the market would bear, to serve any customers they chose, and to design their networks in any way that served their business case. While some policy issues were emerging, they were relatively inconsequential and had virtually no financial impact. There appears to have been no explicit national affirmation of "universal service" nor was it likely that the question would arise in a period when the private sector was building rapidly, when the companies were able to pick and choose attractive financial propositions, and when the policy issues were still undeveloped or at best nascent. It is notable that the turn-

[118] Herbert S. Dordick, "Toward a Universal Definition of Universal Service," Institute for Information Studies, Universal Telephone Service: Ready for the Twenty-First Century, 1991, p. 115; also, Milton L. Mueller, *Universal Service: Competition, Interconnection and Monopoly in the Making of the American Telephone System* (Cambridge: MIT Press and AEI Press, 1997), p. 96.
[119] *See* Warren Stehman, *The Financial History of the American Telephone and Telegraph Company* (Houghton Mifflin, 1925); Gerald W. Brock, *Telephone Pricing to Promote Universal Service and Economic Freedom* (Federal Communications Commission, Office of Plans and Policies Working Paper No. 18, 1986)

of-the-century networks were expanding in regions where there was arguably a positive financial case for telephony—in larger markets or in rural regions with clustered populations. There was simply no need to respond to a question about explicit or implicit support systems in geographies where a financial case existed.

Some policy issues did arise in the early part of the 1900s, including pricing concerns and the relationships between telephone and telegraph, but those matters were more often handled by the states because telephony was primarily local in nature. At the federal level, in the 1910 Mann-Elkins Act, regulatory jurisdiction for *interstate* telecommunications was assigned to the Interstate Commerce Commission (ICC), making telephone companies "common carriers" that were "to provide service on request at just and reasonable rates, without unjust discrimination or undue preference." However, in the early 1900s, policy issues were very preliminary responses to public concerns about market power factors, services, rates, and network interconnection.

The most important policy issue in the first part of the 1900s related to concentration of economic power as railroads, oil, steel and other industries were converging with powerful force, with anti-trust law and economics developing in response. Antitrust concern with telecommunications markets was manifested in AT&T's concession to the US Attorney General in the famous 1913 Kingsbury Commitment, which was a letter from AT&T vice president Nathan Kingsbury. That letter spelled out AT&T's willingness to avoid government intervention in its business by divesting the company's Western Union assets, by agreeing to provide interconnected long-distance services to independent telephone companies under specified conditions, and by forgoing anticompetitive acquisitions if the Interstate Commerce Commission objected to those mergers.[120] The first generation view of "universal service," therefore, was focused at least on interconnected and "compatible" networks that resulted in the implementation of an orderly policy, primarily driven by financial factors constrained by antitrust rules.

Universal service, as a concept, took a better defined, but still general, form in the Communications Act of 1934 where legislators asserted that "common carriers . . . [were] to provide service on request at just and reasonable rates . . . . to make available . . . to all people of the United States . . . adequate facilities at reasonable charges."

First Generation Universal Service, 1921-1970

While the Kingsbury Commitment represented an agreement to slow or stop the AT&T consolidations, it was not until 1921 that the Willis-Graham Act officially relieved the telephone companies from antitrust constraints, effectively concentrating long-distance services in AT&T and providing the legal foundation for a more consolidated marketplace. The Willis-Graham Act was, according to some observers, the foundation for the monopoly-based first-generation universal service policy."[121] A little over a decade later, the Communications Act of 1934 further reinforced the movement toward monopoly, citing basic policy issues. Without explicitly defining "Universal Service," Congress established its telecommunications purpose "so as to make available, so far as possible, to all people of the United States a rapid, efficient, nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges." The 1934 Act also established a separate Federal Communications Commission, replacing the ICC, to assume new responsibilities in regulating interstate

[120] *See* Jonathan E. Nuechterlein and Philip J. Weiser, *Digital Crossroads: American Telecommunications Policy in the Internet Age* (Cambridge: MIT Press, 2005), pp. 6, 13, 62.
[121] Milton Mueller, *"Universal Service" and the new Telecommunications Act: Mythology Made Law,* Communications of the ACM, Rutgers University (March 1997).

communications tariffs and services. As most careful academics note, the Communications Act of 1934 did not create explicit universal service mechanisms nor did it apparently conceive of the need to establish specific universal service programs.

State regulation of telecommunications began as early as 1907 in New York and Wisconsin.[122] Most states adapted the commission model previously used to control railroad practices. Indeed, the National Association of Regulatory Utility Commissioners was founded in 1889 as the National Association of Railroad Utility Commissioners. Early state regulation focused on rate setting, and in particular on elaboration of the rate of return methodology. Setting rates based in some way on costs necessitated apportioning costs between the interstate and intrastate spheres, and competing methods (station-to-station and board-to-board) were designed to do so.

Within the intrastate sphere, costs were not always allocated evenly among types of customers, or in accordance with cost causation. Rather, various rate differentials were developed to promote ubiquitous and affordable service. Intrastate long distance and access rates were well above cost, and above interstate rates. "Postalized" rates, however, many times kept rural rates the same as urban rates, even though that often meant they were below the cost of providing rural service. Residential rates were typically lower than business rates. These differentials, while criticized as uneconomic, were justified as value-based pricing. Years later, additional features, so-called "vertical services" such Caller ID, were priced well above cost in order to contribute to the support of basic service, described as "residual pricing." Even company-owned directories were treated as contributing to cover the costs of basic phone service. All of these cost pricing mechanisms were implicit internal supports or internal cross-subsidies. Together with the process of jurisdictionalizing and allocating costs, the cross-subsidizations constituted the core implementation tools of universal service policy. With the gradual introduction of competition for specific services, and its eventual spread, these policy tools became less sustainable. With competition, the introduction of new technologies, the arrival of new stakeholders in the regulatory process, and the shifting relations of state and federal regulators, the substance of state regulation also began to shift, and the state regulator's job became more complicated and difficult.[123]

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From the time of the 1934 Act until the 1960s, the telephone industry grew as a regulated and generally effective monopoly in which internal cross-subsidies further facilitated the spread of the network. The rate-of-return system made it possible to invest and achieve a predictable return on investment—to build and maintain ubiquitous telecommunications systems.

Second Generation USF, 1970s-1996

By the late 1960s and early 1970s, AT&T and regulators were faced with emerging competition in the long-distance markets. The process started innocuously. The early signs included the FCC's 1968 Carterfone decision[124], which permitted the use of non-monopoly (non-AT&T)

[122] Paul Eric Teske, After Divestiture: *The Political Economy of State Telecommunications Regulation* (SUNY Press, 1990), Chapter 1.
[123] *See* "Substance Plus Process – Telecom Regulation Reforms to Protect Consumers, Preserve Universal Service and Promote Competition," 71 U. Colo. L. Rev. 819 (Fall 2000).
[124] 15 FCC 2nd 605 (1968).

equipment attachments for private company networks, and the 1969 MCI (Microwave Communications Inc.) decision that cleared the way for MCI to operate private line services between Chicago and St. Louis. It was a short step before private lines were connected with private-branch exchange ("PBX") switches, making possible switched long-distance services. The seeds of change undercut the implicit cross-subsidies in the AT&T monopoly, jeopardizing the company's ability to use one set of revenues to support other higher-cost parts of the network. Effectively, MCI had challenged the implicit system when it proved itself able to serve the most profitable long-distance customers without having to support the costs of local service.[125]

By the late 1960s and early 1970s, AT&T and regulators were faced with emerging competition in the long-distance market.

The response of industry was to focus the financial factors more sharply, searching for and creating new systems to accomplish what had previously been formulated as an implicit system in a compact between corporate and public welfare. Explained in financial terms, AT&T and policymakers recognized that implicit cross-subsidies could not be directed from specific competitive markets to those that were higher cost. If the higher-cost services were to be maintained and supported by the new competitors, new systems were needed. AT&T and policymakers settled on an access regime to allocate costs paid by AT&T and by the new competitors in a way that ensured that rural and residential rates should remain "affordable" through more explicit rate regulation. The practice was formalized in the FCC's so-called "Ozark plan," adopted October 27, 1970.[126] Although separations had first been introduced in 1947, the Ozark Plan established new procedures for separating and allocating plant investment, operating expenses, taxes and reserves between the intrastate and interstate operations of telephone companies with a view to ensuring that rates and costs were aligned on the basis of policy. Separations and access were therefore more explicit mechanisms that allowed telephone carriers to redirect financial returns in support of higher-cost network elements. Policymakers and companies alike recognized that the goals of ubiquity and low-priced services could not be abandoned, as social welfare and economic viability were tied to communications availability.

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During the 1980s, more significant explicit changes emerged. In 1983, the AT&T divestiture of local exchange carrier (LEC) services occurred. That same year, the FCC created the National Exchange Carrier Association to perform telephone industry tariff filings and access revenue distributions. In 1984 and 1985, the FCC established programs to provide explicit funding to eligible low-income households. In 1989, the Bell companies and other large LECs chose to leave the NECA "pool," but agreed to support the pool through payment of long-term support, which was a USF cost recovery system that shifted certain variable access charges to fixed common line payments recovered from long-distance companies, with the per-line billing based on the number of presubscribed lines. [127]

[125] Robert W. Crandall and Leonard Waverman, *Who Pays for Universal Service? When Telephone Subsidies Become Transparent* (Washington, DC: Brookings Institution Press, 2000), p. 9.
[126] 26 F.C.C. 2d 247 (1970).
[127] The penetration of phone service nationwide increased from 91% in 1984 to 93.8% in 2004. In Texas, the increase was from 88.4% to 91.8%. Monitoring Report, Table 6.2.

In February 1996, the U.S. Congress passed the Telecommunications Act of 1996, which explicitly affirmed the principles and framework of universal service in Section 254. The FCC was then charged with the formulation of the more specific systems that were to implement the reform sponsored by the 1996 Act.

Third Generation USF, 1996 to the Present

Universal service began as an implicit policy and evolved as explicit mechanisms that embraced interconnected, affordable and ubiquitous telecommunications services. However, the system has changed more dramatically since the FTA of 1996. It might even be suggested that the FTA not only formalized the previous implicit and explicit high-cost allocations, but it also put into motion forces that created new problems. The problems with the universal service fund today are several. First, under Section 254 of the FTA, funding is dependent on interstate and international funding sources, which are now shrinking because of competition and the substitution of new services for traditional long distance. Second, the federal fund's problems are also significantly related to increasing funding obligations, which have three primary causes.

1. Step-function growth for new programs, Schools and Libraries and the smaller program for Rural Health Care. Schools and Libraries support is capped at $2.25 billion per year, so this is not a source of ongoing growth, but that funding represents a sizeable new commitment.

2. Step-function growth from shifting implicit access-charge-support to explicit USF funding. This shift did not constitute additional revenue for rural ILECs, which had previously received access payments for use of their networks to originate or terminate traffic.[128] Further, consumers who had paid for access charges are presumptively not paying more, as they paid a certain amount for access in their long-distance bills, and are simply now paying ILECs those same amounts under the USF line-item while experiencing the dollar-for-dollar reduction in long-distance charges.

3. Ongoing growth caused mainly by payments to competitive eligible telecommunications carriers (CETCs) under the "identical support rule." This final growth problem has emerged since 2001 when the FCC committed to "portable" USF payments under the rubric of "competitive neutrality." In this case, CETCs can receive uncapped payments to ensure that they are allocated the same per line monies as the incumbent receives in high-cost regions. CETCs receive support based on the costs of the incumbent carrier, which may be completely unrelated to the CETC's own costs.[129]

To provide a summary illustration, **Figure 14** depicts the total USF obligation that has grown dramatically from 1998 when the fund distributions were slightly above $2 billion to 2006 when the distributions are about $7 billion. The ILEC high-cost funding is depicted at the bottom of the graphic, which illustrates a relatively flat year-over-year payout since 2002. From 1999 to 2002, the ILEC receipts rose, primarily because of the transfer of payments from interstate access rates to explicit USF support and because of a "true-up" to adjust the High Cost Loop fund that had been frozen at a lower level pending the reforms. It can be argued that USF that was implicit became explicit and the

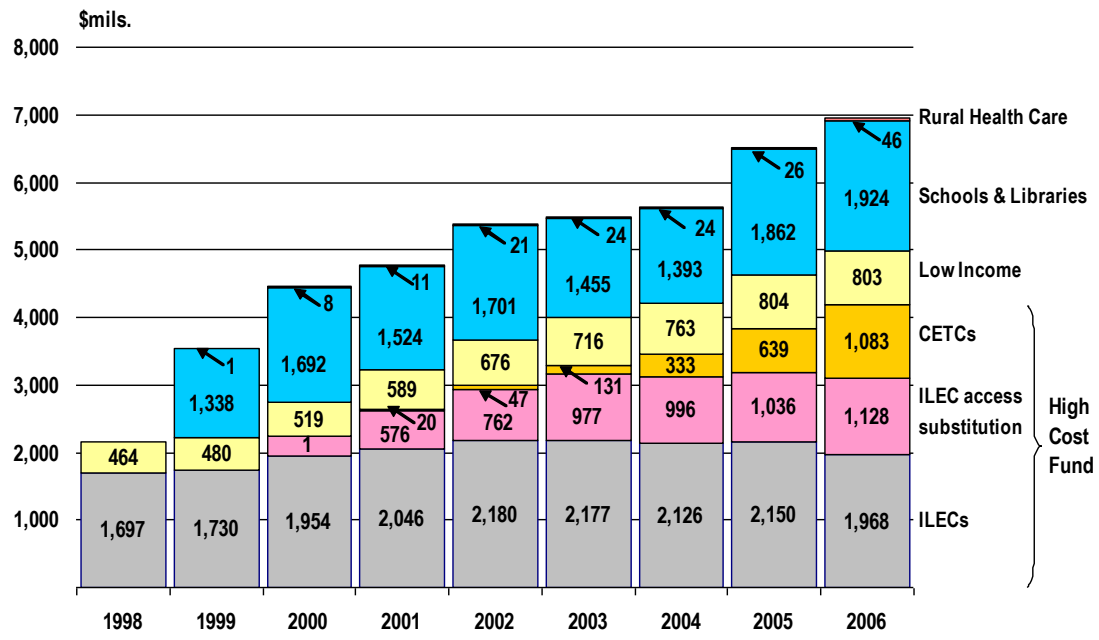
[128] It did constitute new revenue for competitive eligible telecommunications carriers (CETCs), which benefited from paying lower access charges and under the federal "identical support rule", received the access replacement support even though they had no need to replace pre-existing access payments.

[129] 47 C.F.R. §54.307.

correct analysis would be to consider the consumer perspective, which involves the entire access regime and the entire USF regime to evaluate what has occurred. As is apparent in the figure, the reality is that the total sum of access replacement plus ILEC universal service funding has remained relatively unchanged from 2002. Such an analysis would be consistent with the FTA's recommendation that implicit funding should be shifted to explicit funding, and it would cast a very different light on the source of the growth.

The total USF obligation has grown dramatically from 1998 when the fund distributions were slightly above $2 billion to 2006 when the distributions are about $7 billion.

Figure 14: Total USF 1998-2006



Source: USAC and Balhoff & Rowe, LLC.

The specific funding obligations have attracted more attention from the net payer companies and net payer states, but this is not an issue with which the Texas Commission is concerned. It is therefore not examined at length in this White Paper except to note that carriers and states that have a net obligation to the fund have been more inclined to be critical about USF funding.

It is helpful to note that the "system" of assigning USF monies has been generally study-area-based, or, in the case of Texas, exchange-based. The insights of **Part I** of this White Paper suggest that USF needs to be better targeted at some time in the near future—disaggregated so that

network investment in high-cost regions are better supported, possibly at the sub-wire-center level. Importantly, if there is better targeting to support networks in high-cost areas, it may be that the "competitive neutrality" problem is more appropriately resolved, since, as **Part II** suggests, competitors do not appear to serving Out of Town regions. That is, in many of the truly high-cost regions, there are not multiple competitors present. If this proves to be the case, the funding obligations may be reduced and the policy goals may be better aligned with the funding requirements.

An increasing number of states created state universal service programs during the post-1996 "third phase" of universal service in order to complement federal funding. In 1998, there were fourteen state funds, growing to twenty-four by 2002. Most of the funds were created by state legislatures. The preferred method of supporting the funds was an assessment on intrastate revenues, while a smaller number of states used a line charge. About half of the states adopted the FCC criteria for receiving support, while the other half developed their own state-specific criteria. Some state programs included multiple program elements, such as low income support, but all included high cost support[130]

In summary, the post-FTA reforms have provided a formal legal foundation to high-cost universal service funding, which had evolved over the past century from implicit cross-subsidies to explicit funding mechanisms. The reforms also added new fund elements in order to achieve certain goals including provision for rural health care and the communications needs of schools and libraries. Finally, the policy reforms attempted to reconcile emerging competition with high-cost support, and chose to do so by payment of the same per-line monies to competitors as are paid to incumbents in high-cost regions.

The post-FTA reforms have provided a formal legal foundation to high-cost universal service funding which had evolved over the past century from implicit cross-subsidies to explicit funding mechanisms.

[130] Ed Rosengerg, Ph.D., Chang Hee Lee, Lilia Perez-Chavolla, *State Universal Service Funding Mechanisms: Results of the NRRI's 2001-2002 Survey* (National Regulatory Research Institute 2002).

Appendix III: Texas Universal Service embracing the challenges

The Texas universal service system and federal universal service policy have similar goals. At the same time, the Texas system remains complementary in ensuring support for network providers that supply important services to customers in very high-cost areas. In fact, Congress expressly reserved to the states the jurisdiction over "charges, classifications, practices, services, facilities, or regulations for or in connection with intrastate communication service."[131] Concerning universal service policy, the FTA provides that any "State may adopt regulations not inconsistent with the [FCC's] rules to preserve and advance universal service."[132] Texas has responded to the statute and implemented its state-specific systems designed to ensure that consumers have "safe, reliable, high quality services that meet the needs of all Texans at just and reasonable rates."[133]

A brief examination of universal service policy in Texas confirms that the federal and state universal service policies are consistent with the evolution outlined in the previous sections of this White Paper. In part, Texas participates in managing a cost allocation set of mechanisms as one of the essential elements of the cooperation between jurisdictions, and those mechanisms are simply a modification of previously implicit supports that were made explicit in 1999.[134] There are other means of cooperation between the states and the federal government, which include input from states into Federal Communications Commission deliberations on federal mechanisms, and collaborative work on federal universal service policy in the form of state-supported efforts on the Federal-State Joint Board.[135]

"Customers in all regions of Texas shall have access to telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at prices that are reasonably comparable to prices charged for similar services in urban areas."

The current review process of the Texas PUC relates to a set of changes implemented when the State committed to access reforms. At that time, it was determined that it was the statutory policy of Texas to "maintain a wide availability of high quality, interoperable, standards-based telecommunications services at affordable rates."[136] In 1997, Texas amended the Public Utilities Regulatory Act (PURA) to include a provision whereby the PUC was charged with establishing a universal service fund. By statute, the Texas Legislature declared that:

> *customers in all regions of this state, including low-income customers and customers in rural and high-cost areas, [shall] have access to telecommunications and information services, including interexchange services, cable services, wireless services, and advanced*

[131] 47 U.S.C. § 151.
[132] 47 U.S.C. § 254(f).
[133] 16 TAC §26.1.
[134] *See infra* at p. 48.
[135] The 1996 Act also set up a process whereby states were required to review and report on a BOCs application to enter in-region, interLATA toll market prior to approval by the FCC. 47 U.S.C. § 271(d)(2)(b), and other mechanisms for coordinating between federal and state policy and practice.
[136] PURA § 51.001(b)(3).

> *telecommunications and information services, that are reasonably comparable to those services provided in urban areas and that are available at prices that are reasonably comparable to prices charged for similar services in urban areas.*[137]

The Texas Legislature also emphasized that all Texans should have access to telecommunications so that economic development might occur throughout the State.[138] After the FTA, the Texas state legislature charged the PUC with establishing a universal service fund "to assist telecommunications providers in offering basic local telecommunications service at reasonable rates in high-cost areas."[139] The Texas PUC implemented the legal mandate by creating two high-cost support funds—the Small and Rural Incumbent Local Exchange Company (SRILEC) Universal Service Plan and the Texas High-Cost Universal Service Plan (THCUSP). The funding was based on a reform of intrastate access rates—to lower access rates while offsetting those reductions of implicit support with explicit Texas Universal Service support.

The State USF funding was based on a reform of intrastate access rates—to lower access rates while offsetting those reductions of implicit support with explicit Texas Universal Service support.

SRILEC Universal Service Plan

Small and rural telephone companies are eligible to receive support under the SRILEC plan.[140] Support is available only for the provision of basic telecommunications services.[141] The support is monthly, per-line funding, and is determined by a one-time calculation using audited data from the recipient's test year, which was set at 1997.[142] The amount of monthly support is the sum of the toll pool amounts and access/toll revenue reductions determined in accordance with the PUC's regulations, divided by the eligible number of lines being supported, divided by twelve.[143]

The SRILEC plan is based upon the small or rural ILECs' actual costs of providing service, frozen at 1997 levels.[144] The methodology is similar to the system by which federal universal service funds are distributed to rural carriers. The primary difference is that under the federal universal service plan, rural carriers are allowed a modest growth factor, so the amount of per-line support can increase with other indices

[137] PURA § 51.001(g)
[138] PURA § 51.001(d)(2).
[139] PURA § 56.021.
[140] The SRILEC plan was largely implemented by Texas PUC Docket No. 18516. "Small local exchange company" means any incumbent certificated telecommunications utility as of September 1, 1995, that has fewer than 31,000 access lines in service in this state, including the access lines of all affiliated incumbent local exchange companies within the state, or a telephone cooperative organized pursuant to the Telephone Cooperative Act, Texas Utilities Code Annotated, Chapter 162. 16 TAC §26.5(198). "Small incumbent local exchange company" means an incumbent local exchange company that is a cooperative corporation or has, together with all affiliated incumbent local exchange companies, fewer than 31,000 access lines in service in Texas. 16 TAC § 26.5(199). Rural incumbent local exchange company means ILEC that qualifies as a "rural telephone company" as defined in 47 United States Code § 3(37) and/or 47 United States Code § 251(f)(2). 16 TAC §26.5(187).
[141] *See infra at* p. 50.
[142] 16 T.A.C. § 26.404(e).
[143] *Id.*
[144] 16 T.A.C. § 26.404(e)(2).

that track line growth, inflation and the gross domestic product.[145] Additionally, the federal plan analyzes embedded costs annually. **Appendix II** on page 74 provides more detail regarding the federal program.

Texas High-Cost Universal Service Plan

The THCUSP is the other mechanism by which Texas carriers that serve high-cost areas are able to recover their costs.[146] Similar to the federal non-rural, high-cost model program, THCUSP support is based on a carrier's forward-looking economic costs.[147] Carriers are eligible to receive support to the extent that their forward-looking economic costs exceed the benchmark amount for the costs of providing local service in Texas.[148] The THCUSP utilizes a model to calculate a carrier's forward-looking economic costs, and thus that carrier's level of support. In theory, the model is designed to yield the most efficient costs so that carriers can recover portions of the required investment based on the lowest investment costs available.

Hold Harmless Provisions of Texas Universal Service

Consistent with the collaboration in providing federal and state support, the Texas Legislature enacted §26.025 of PURA to ensure that carriers that may lose federal universal service support would have the ability to fully recover their costs from state universal service funds. The approach is consistent with complementarity between federal and state policy in meeting the state's telecommunications needs. In implementing the statute, the Texas PUC created a plan to adjust for the case where a carrier loses federal universal service funds by way of an FCC "order, rule, or policy, the effect of which is to change the federal universal service fund revenues of an ILEC or change costs or revenues assigned to the intrastate jurisdiction." In such a case, the Texas PUC will allocate funds from the state universal service fund or allow the carrier to increase its rates to recover from any shortfall in the revenue requirement for any such carrier.[149] As the statute and regulations confirm, universal service is a delicate support mechanism, balancing federal and state obligations, to ensure a financially viable business case for the provision of a specified set of services in uneconomic high-cost areas.

Contribution Methodology

The FTA requires that any state that establishes an explicit universal service support fund pursuant to Section 254(f) must fund such a program through contributions from every telecommunications provider that provides intrastate telecommunications service, and do so on an equitable and non-discriminatory basis.[150] The Texas Legislature implemented such a contribution methodology in the PURA.[151]

[145] *See* 47 C.F.R. §§ 36.604 and 36.611; *see also Rural Task Force Order*, 16 FCCR at 11262, ¶. 39 and 11266, ¶ 48.
[146] The THCUSP plan was largely implemented through Texas PUC Docket No. 18515.
[147] 16 T.A.C. § 26.403(e).
[148] There are two benchmarks under the THCUSP—one for residential service and one for single-line business services. 16 T.A.C. §403(e)(1)(B).
[149] 16 T.A.C. § 26.406(b)(2).
[150] 47 U.S.C. § 254(f).
[151] PURA § 56.022.

Scope of Support

Like the federal program, the Texas PUC has limited the scope of available telecommunications services eligible to be reimbursed from universal service funds (i.e., "supported services"). Those services include:

(a) Flat rate, single party residential and business local exchange telephone service, including primary directory listings;
(b) Tone dialing service;
(c) Access to operator services, directory assistance services and 911 service where provided by a local authority;
(d) Dual party relay service;
(e) Ability to report service problems seven days a week;
(f) Availability of an annual local directory;
(g) Access to toll services; and
(h) Lifeline and tel-assistance services. [152]

The list of supported services is nearly identical to the list of services eligible to receive federal support.

Eligibility

Pursuant to the Section 214(e) of the FTA, in Texas, a carrier must be designated as an eligible telecommunications carrier (ETC) to receive federal universal service support. To receive support from either of the two Texas universal service support programs, carriers must be designated as an eligible telecommunications provider (ETP) by the Texas PUC.[153] To be designated as an ETP, a carrier must first be qualified as an ETC to receive federal support. To be designated an ETC in Texas, a carrier must:

(a) Meet all of the eligibility requirements of the federal ETC designation standards set out in 47 C.F.R. § 54.101 either using its own facilities or a combination of its own facilities and resale of another carrier's services; and

(b) Advertise the availability of and charges for such services using media of general distribution.[154]

To qualify as an ETP (and thus become eligible to receive support from one of the two Texas universal service funds), a carrier must meet all of the eligibility requirements of an ETC, and the following:

(a) Define its ETP service area based upon wire centers or other geographic area as determined appropriate by the PUC if seeking funding from the THCUSP or the entire ILEC study area if seeking funding from the SRIUSP fund;

(b) Offer customers service at a rate not higher than 150% of the ILEC's tariffed rate;

[152] P.U.C. Subst. R. 26.403(d)(1)
[153] PURA § 56.023(a)(2) charges the PUC with determining "which telecommunications providers companies meet the eligibility criteria."
[154] 16 T.A.C. § 26.418(c). In addition, to receive federal support, ETCs in Texas must also offer Lifeline Service to qualifying low-income consumers in compliance with 47 C.F.R. Part 54, Subpart E, and offer toll limitation service in accordance with 47 C.F.R.§§ 54.400-401. *See* 16 T.A.C. § 26.418(d).

(c) Offer basic telecommunications service using either its own facilities, purchased unbundled network elements, or a combination of its own facilities, UNEs and resale of another carrier's services;

(d) Offer continuous and adequate service within the area or areas in which they are designated an ETP in compliance with the PUC's quality of service standards; and

(e) Advertise the availability of, and charges for, supported services using media and general distribution.[155]

The ETP standards in Texas are somewhat more rigorous than the federal ETC requirements. Specifically, the PUC and the industry have an obligation to ensure that all consumers, regardless of their location within the state, are able to receive at least basic telecommunications service through the state's Provider of Last Resort statute.

[155] 16 T.A.C. § 417(c).

Appendix IV: Purpose & Methodology

Purpose of the White Paper

This White Paper has specific purposes that should aid in the creation of a balanced and thoughtful assessment of the Texas universal service telecommunications program, and, by extension, of any state's universal service obligations under State law and consistent with Section 254 of the federal Telecom Act of 1996.

1. **Provide a frame of reference for the Texas inquiry.** This White Paper provides a clear and well-documented financial frame of reference for the Texas policymakers. This paper aspires, not so much to answer all the individual questions posed by the policymakers, as to provide a framework based on a verifiable analysis of financial data with additional perspective drawn from the federal history, state regulations, and competitive factors that come to bear on Texas universal service. A fuller presentation of the federal USF system and history is available in the first two appendices, which begin on pages 56 and 70.

2. **Supply financial data to understand the impacts of capital and operating commitments in high-cost regions.** As noted in the Executive Summary, this report offers various insights. The study provides new and important analyses of substantive financial data that clarify the value of state-sponsored USF up to the present and its importance for the future. The analyses are drawn to a limited extent from public information, but to a great extent are based on confidential information supplied by four non-Bell companies that serve rural Texas consumers. The financial data point to high ongoing operating obligations and costs associated primarily with the policy commitment to ubiquitous affordable services for all consumers, particularly in regions outside of rural towns. These investment and operating costs reveal that wire centers and sub-wire center operating areas have significantly varying financial characteristics, depending on their sizes, distance from the central office switch, and density of the service region. The figures tell a story that is not well-understood, as significant portions of most wire centers are deeply uneconomic at least based on customer revenue from "supported services."[156]

   The analyses are drawn to a great extent from confidential information supplied by four non-Bell companies that serve rural Texas consumers.

3. **Clarify competitive trends that affect USF receipts and the program goals.** Important new technologies and competitive trends are emerging, attracting enthusiastic support from competitors, policymakers and customers. The new technologies hold significant promise for a wider range of services and lower pricing. At the same time, there are serious misconceptions about the new services, including the relationship between the "wired" network and the developing technologies. Notably, wireless and Internet Protocol

[156] "Supported services" revenue streams included in this analysis consist of Basic Area Local Revenue, End User Common Line (excluding USF surcharges), Carrier Common Line, Switched Access (including CALLS support), IntraLATA Toll, and High Cost USF support where indicated. Costs and investment reflect what is required to provide R1/B1 services (including loop, transport, and switching), with returns calculated based on net investment (after accumulated depreciation).

services generally rely upon the ILEC wireline network infrastructure that remains foundational to the economic health of those companies as well as the economic health of urban and rural regions. The loss of a ubiquitous "wired" network or the potential for creating a distressed ILEC could put those emerging services at risk in high-cost regions.

4. **Model future impact on rural regions in light of current trends to discern the implications for the high-cost-carrier's financials.** State policymakers must consider the forces that will affect the foreseeable future. Indeed, this is an important premise of the Texas Legislature's and the PUC's review. This paper is designed to provide a view of the challenges that are unfolding and those that are likely to continue over the next years or decades in rural service areas, including the economically healthy regions that are being, and will increasingly be, targeted by competitors. In this way, today's universal service commitments might be better matched with services and infrastructure needed to meet the growing broadband and other communications needs of all Texas consumers.

5. **Sharpen the understanding of USF and the relationship between the federal and state USF obligations**. The Texas inquiry is an important proceeding in its own right. It also appears to be appropriately viewed in the context of the nationwide universal service obligation. National laws, principles, regulations and systems affect the way in which universal service is implemented. Notably, the federal USF discipline is currently under review and is likely to be modified in the next year or two through legislation and/or regulatory action. This White Paper attempts more precisely to clarify state policy in the national USF framework so that the inquiry can be focused, constructive, and productive for Texas policymakers.

6. **Focus on the risks and opportunities that flow from the decisions made by policymakers in this proceeding.** Texas policymakers understand that there are risks and opportunities directly arising from their decisions about the TUSF. Communications has always been a major economic factor and is growing to be even more important with the proliferation of broadband services that have accelerated economic, educational, social and national security-related benefits. Those services, however, ride on networks that are figurative waterways or roads on which many boats or motor vehicles are transported. It is therefore not an overstatement to suggest that a wide range of commercial and social service providers rely—or navigate—upon a dependable, flexible and constantly evolving robust network platform. As has been the case for the last century, that network continues to be influenced by sound public policy and, in high-cost regions, by appropriate and far-sighted support. In short, the welfare of high-cost regions as well as of densely-populated locales will continue to be profoundly affected by access to information, software, enterprises, entertainment and other resources. Policymakers should have a clear understanding of their role in controlling some of the key gating factors that put rural customers either at risk or in a favorable position to participate in the evolving marketplace. Further, policymakers should understand the economic and social benefits generated by supporting access to rural regions, which means that urban family, friends, business and other commercial enterprises drive value by access to rural customers.

7. **Propose directions for eventual reform of TUSF to better align the fund with policy goals.** This report focuses on policymakers' constructive questions about adjustments that might be proposed for the TUSF. The Legislature is mandating a review so that consumers in Texas will be best served over the next decades. It is clear that consumer needs, technologies, competitive activities, and policies have not been, and will not be, static. Accordingly, this report proposes a constructive focus and further set of inquiries about approaches that can build upon the extraordinary accomplishments of the historical universal service commitment in Texas. While solutions are not specifically proposed, this report highlights the problems more sharply, including the high-cost areas that continue to require support and the systemic problems emerging because of competitive patterns.

Understanding the financial data and realities of universal service

The debate surrounding universal service at the national level and in other states can be confusing. Very often, the polemic has devolved to generic policy questions, lofty economic arguments, accusations of abuse, and anecdote. This White Paper focuses notably on financial issues central to achieving and maintaining universal service in Texas. As noted in the Executive Summary, the study offers significantly more detail regarding certain financial data that are believed to be representative. It is the contention of the authors that the data are more compelling than the anecdotes or theoretical arguments. Still, as with every effort to be factual, certain interpretations or limitations must creep into the analysis.

First, while the data do not represent all Texas access lines, they do reflect the underlying trends in a way that policymakers should find materially helpful. Financial data drawn from various companies and even from various exchanges reflect significant differences. The premise in this White Paper, however, is that the larger pattern is discernible in these "representative" or "sampled" data. The data tell a story that is credible and informative.

A second clarification is that the large telecommunications companies in Texas receive funding based on a forward-looking model. Consistent with that methodology, many of the analyses in the text are based on forward-looking models similar to the model that has been used by Texas policymakers in assigning state USF. The data were originally developed for internal company planning purposes, not for external advocacy. Consequently, the models are believed to be efficient and financially sound. Revenues from the various exchanges and sub-wire center areas are based on hard data, but operating costs and investment reflect the forward-looking models that are believed to be reasonably accurate.

Third, the financial data used in this study are based on "supported services." That is, the revenues, investment and operating costs pertain to services that are supported by USF payments. Other revenues may be generated by the carrier in serving those customers, but every effort has been made to exclude these incremental revenues and the investment costs for services such as DSL and the operating costs associated with those other services. Notably, this study is about USF and the services those payments support, and the decision to exclude other services is simply an effort to make the study more rigorous.

Finally, it is noteworthy that certain information analyzed in this report is commercially sensitive. As a result, the authors have "aggregated" the data and used percentages so that the specific sources are not identifiable. However, it is important to state that the underlying data are unchanged and are factual or are based on forward-looking models that are functionally similar to the Texas-mandated HAI model. The authors have access to the original data and have performed the analytics, without any untoward influence by the companies, to generate the "aggregated" summaries.

Appendix V: About the Authors

Michael J. Balhoff, CFA
Managing Partner

Michael J. Balhoff, CFA, is managing partner at Balhoff & Rowe, LLC, a group that provides financial-regulatory consulting and advisory services to telecommunications companies and policymakers. Before starting his own firm, Mike Balhoff headed for 16 years the Telecommunications Equity Research Group at Legg Mason and, in the final seven years at Legg, covered equities in the incumbent local exchange carrier industry. Prior to joining Legg Mason in 1989, Mike held posts as a graduate and undergraduate teacher. Mr. Balhoff has a doctorate in Canon Law and four master's degrees, including an M.B.A.—concentration finance— from the University of Maryland. He is a CFA charterholder and is a member of the Baltimore Security Analysts Society. Mr. Balhoff has been named on six occasions as a Wall Street Journal All-Star Analyst for his recommendations in the Telecommunications industry. His coverage of telecommunications, and especially rural telecommunications, was named by Institutional Investor as the top telecommunications boutique in the country in 2003. He and his wife, Frances, have three children and live in Maryland.

Robert C. Rowe, JD
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Robert C. Rowe, Esq., is a senior partner at Balhoff & Rowe, LLC. Previously, Mr. Rowe served as the Chairman of the Montana Public Service Commission which was responsible for regulating telecom, electricity, natural gas, water, and some transportation services. Mr. Rowe also served as President of the National Association of Regulatory Utility Commissioners, Chairman of the NARUC Telecommunications Committee, member and state chair of the Federal-State Joint Board on Universal Service, member of the Federal-State Joint Conference on Advanced Services, chairman of the thirteen state Operations Support Systems Collaborative working with Qwest and its competitors to achieve compliance with Section 271 of the 1996 Federal Telecommunications Act, and member of various advisory boards for university-affiliated programs. Rowe led the Montana PSC's participation in a major utility bankruptcy. He has testified frequently before Congress, and has consulted with and trained non-U.S. energy and telecoms regulators.

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Bradley P. Williams is a partner at Balhoff & Rowe. He joined the firm in 2005. Previously, Mr. Williams was a member of the Strategic Planning & Business Development group at Lowe's Companies Inc., the Fortune 50 home improvement retailer. Prior to joining Lowe's, Brad worked with Mr. Balhoff in the award-winning Telecommunications Equity Research Group at Legg Mason, focusing on incumbent and rural local exchange carriers. Prior to joining Legg Mason, Brad was a co-founder of eSprocket / Beachfire, a venture-backed company that evolved into one of the pioneers in mediation technology solutions for the financial services sector. Previously, he served as a financial executive for

Iron Road Railways Incorporated, a Washington, D.C.-based holding company that integrated, through acquisitions, a significant regional freight rail network serving northern New England and eastern Canada. Brad began his career as an investment banker in First Union's Capital Markets Group. He has a BA in Economics from the University of North Carolina and a JD from the University of North Carolina School of Law.