first requirement has been pursued so that each LEC could provide local service to new subscribers throughout its defined service area on a timely basis. LECs have deployed facilities in anticipation of the need for local service so that State commission-mandated installation intervals would be met even when uneconomical. The carrier of last resort obligation has been funded and offset by the historical structure of the industry and the implicit support flows embedded in existing LEC rates. Incumbent LECs have been required to make uneconomic long-term decisions and to make investments well prior to the realization of market demand to meet those obligations.

The Act has not expressly eliminated that obligation for the incumbent LECs, nor does it expressly require other eligible carriers to assume that same position. If the incumbent LEC retains that obligation, it will still be required to deploy facilities in anticipation of servicing customers even though another carrier may finally provide universal service. The same opportunity for unrecovered investment exists if there are two or more eligible carriers in a service area and each has carrier of last resort obligations. In order to help avoid regulatory takings issues, the Joint Board and the Commission must resolve unrecovered investment and universal service support issues in these situations where carrier of last resort obligations are not alleviated.

B. Resold Universal Services

Under the Act, a carrier can use resold services and network elements of another carrier to meet the criteria necessary to be deemed an eligible carrier. In fact, those services and elements could conceivably be obtained from another eligible carrier. The intent of universal service support is to offset a portion of the costs required to supply universal service so that prices remain affordable even in high-cost areas. Funds should be available only to those carriers providing the network facilities

used. In situations where the reseller is purchasing resold services in a supported high-cost area, the reseller will already be receiving "support" in the form of a below cost price of the resold service or element. Making universal service support funds available to resellers in addition to below-cost resold services would be economically inefficient at best, and nonsense under virtually all circumstances. Only the carriers incurring the actual costs of constructing and operating the network being used to provide service should be explicitly funded through universal service support mechanisms. Subsidizing resellers with amounts above the discounted high-cost resale prices would reduce economic efficiency because resellers add value only through administrative (i.e., billing and marketing) efficiencies,[34] would discourage the carriers actually providing network facilities from adding to, and maintaining existing, infrastructure, and raise regulatory takings issues.

C. The Enhanced Service Provider Exemption

Perhaps the fastest growing implicit subsidy is the one given to enhanced service providers (ESPs), which allow ESPs to avoid interstate access charges under current Commission policy. Maintaining this exemption is wholly inconsistent with the Act. Requiring some households to pay a higher price to further the national priority of universal service while continuing to mandate implicit support for thriving businesses[35] simply cannot be squared with either the intent of the Act or the

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[34] Universal service support funds provided to a reseller can represent nearly pure profit. If the level of universal service support is sufficiently high, resellers can establish retail prices below prevailing LEC rates and still earn positive profits while the LEC incurs costs in excess of its revenues to deploy and maintain resold facilities.

[35] See N.A.R.U.C., 733 F.2d at 1136, 1137, where the Court accepted the Commission justification for preferential ESP treatment that it was "necessary to preserve their financial viability" for a transitional period.

Commission objective of a "minute is a minute" interconnection rates between carriers. The Joint Board should recommend a swift elimination of the ESP exemption and endorse it be addressed in long-term access reform.

D. The Need for Capital Recovery by Incumbent LECs

The Act highlights another form of implicit universal service support -- lengthening the depreciation lives of equipment to keep depreciation expense lower than economically justified, with the lower customer rates that result. This process served as a "pay me later" opportunity to defer capital recovery payments. LEC depreciation rates were and still are treated as a source of implicit support.[36] When incumbent LECs operated exclusive franchises, they were ensured a fair opportunity to recover investment. As competition eroded that concept, recovery of under-depreciated investment became less certain. No longer able to rely upon the regulatory contract to ensure recovery, SWBT and all other Tier 1 LECs effected huge depreciation reserve "write ups" on the external financial books.[37] The depreciation reserve for SWBT was increased by nearly $4.7 billion.

Under-depreciated plant exists and must be addressed. Those investments were made under the exclusive franchise concept regardless of the profitability of providing local exchange service.

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[36] To the extent that an incumbent LEC's depreciation rates have been set by a regulatory body at a level that does not permit economic recovery of investment, the Act requires that rates be adjusted to eliminate this prospective source of implicit universal service support funding.

[37] The presence of price regulation and increased competition has triggered the discontinuance of regulated accounting (SFAS 71) for external financial reporting pursuant to SFAS 101. The previous use of SFAS 71 was based on the assumptions that prices would recover the costs of providing services (including the recovery of assets through depreciation expense), and that a sufficient number of customers would be present to pay those prices. With competition, those assumptions are no longer valid.

Absent this regulatory social contract, LEC investment strategies and commitments would have been much different (much more similar to those of the current new entrants, that enter only where the investment is profitable). The LECs have kept their part of the regulatory social contract, and must be able to recover the under-depreciated amounts. These under-depreciated amounts should be addressed through explicit capital recovery funds in the Federal and State jurisdictions.

SWBT proposes to recover the shortfall based on a theoretical reserve calculation,[38] an approach that permits calculation of separate amounts for individual jurisdictions. These calculations would use the same shorter economic depreciation lives used to "write up" the reserve on the external financial books. The under-recovered amounts would be identified by State, and then between interstate and intrastate jurisdictions[39] and amortized over 5 to 7 years. Attachment 6 presents estimates of those under-recovered amounts for SWBT.

SWBT is not suggesting that the under-depreciated amounts be included in the general explicit funding mechanisms. Instead, those amounts would first be eliminated from any calculation on the need for explicit universal service support, and recovered through the use of another explicit mechanism over a defined period of time. All telecommunications companies would contribute to this recovery via a surcharge on all retail transactions. Once recovered, the fund would terminate.

Since these funding and recovery mechanisms only deal with the current amount of under-

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[38] The LECs implementing FAS 101 did not use the same methods of calculating their reserve write-up on their external financial books. To calculate the explicit support for additional capital recovery all LECs should use a consistent method, such as a theoretical reserve calculation.

[39] To avoid cost recovery and funding transfers between jurisdictions, each State should have its own intrastate capital recovery fund and interstate capital recovery fund designed to only recover the amortization amount for that specific jurisdiction.

recovery, LECs must have the flexibility to use economic asset lives in prospective regulatory depreciation. Otherwise, future amounts of under-recovery will be accumulated and another true-up required.

Respectfully submitted,

SOUTHWESTERN BELL TELEPHONE COMPANY

By: _____

Robert M. Lynch
Durward D. Dupre
Mike Zpevak
Darryl W. Howard

Attorneys for
Southwestern Bell Telephone Company

One Bell Center, Suite 3520
St. Louis, Missouri 63101
(314) 235-2513

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LIST OF ATTACHMENTS

Attachment 1 - SWBT - Summary of Interservice Support Flows*

Attachment 2 - T. Makarewicz, "Efficient Telecom Pricing: Who Stands to Benefit?", *Public Utilities Fortnightly*, March 15, 1996.

Attachment 3 - Summary of State Legislative and Regulatory Initiatives in Distance Learning and TeleMedicine in SWBT States*

Attachment 4 - Affordability Benchmark*

Attachment 5 - Analysis and Comparison of Benchmark Cost Model

Attachment 6 - Under-Depreciated SWBT Investment*

* Indicates that Attachments 1, 3, 4, and 6 have been submitted in WordPerfect 5.1 format as requested in the NPRM. Attachment 5 was not created in WordPerfect. SWBT is willing to make Attachment 5 available to the Commission and Joint Board in electronic format upon request.

Attachment 1

SWBT - Summary of Interservice Support Flows
From Toll and Access Services

Area	Support Generated			Implicit Interservice Support Received	Net Support
	Interstate	Intrastate	Total		
High Volume - Over 100M Toll and Access MOU	$202M	$630M	$832M	$10M	**Contributes $822M**
Low Volume:					
Group A - Under 1,000 Lines	$3M	$26M	$29M	$136M	**Receives $107M**
Group B - 1,001 to 2500 Lines	$7M	$45M	$54M	$233M	**Receives $179M**
Group C - Over 2,501 Lines	$141M	$478M	$619M	$1,155M	**Receives $536M**
Total SWBT	$355M	$1,179M	$1,534M	$1,534M	

Note: As shown in the table, the total local exchange support currently generated primarily by toll and access services is approximately $1.534 billion. $1.524 billion of this support is necessary to keep local exchange rates reasonable in low-volume, primarily rural areas. This quantification of support flows does not separately identify the amount of implicit support flows generated by intra-service support (i.e.; geographic averaging, residence/business disparity) nor the support generated by discretionary local services (i.e.; vertical service, optional expanded plans, etc.).

EFFICIENT TELECOM PRICING:

Who Stands to Benefit?

Thomas J. Makarewicz

NEW LAWS MAY LIFT MARKET BARRIERS, BUT CONSUMERS WILL CONTINUE TO LOSE OUT UNTIL REGULATORS END INDISCRIMINATE SUPPORT THROUGH ACCESS CHARGES.

Economists often seem enamored of economic efficiency, honoring its merits while decrying the lost benefits of inefficient outcomes. But really . . . what's the harm in a little inefficiency? Well, the harm may be more real than we recognize. Take, for example, the notably inefficient pricing structure for access to the local telephone network The price of basic local telephone service is kept artificially low, supported by a complex web of mandated subsidies, including: 1) revenues from artificially inflated long-distance prices, 2) allocations between classes of customers (*e.g.*, from business to residential), and 3) geographic rate averaging (*e.g.*, high-density urban areas to low-density rural). This pricing system arose before competition—to accomplish the goal of ubiquitous, reasonably priced telephone service. However, universal telephone service can now be achieved without mandated indiscriminate subsidies.

The Access Charge Subsidy

Telecommunications pricing relies intentionally on extensive interservice support to maintain a local exchange network available universally at reasonable rates. But the effort is inefficient.

For example, the pricing system recovers a majority of costs not from users who seek access to the telephone network, but from interexchange carriers (IXCs). The IXCs pay access charges to local exchange telephone carriers (LECs) for the use of the local network; these costs then fall ultimately upon long-distance callers. However, the LEC incurs the same cost to provide customer access to the telephone network whether the customer places a thousand or zero calls. The resulting cross-subsidy was mandated in a near-monopoly environment to keep local rates as inexpensive as possible, thereby encouraging universal telephone service. In other words, consumers, *regardless of need*, pay artificially low local rates at the expense of, among other things, artificially high interstate toll rates.

Economic estimates indicate that the price of basic local service exerts little influence over the customer's decision to buy or retain the service (The price elasticity of demand for local service is extremely low). At the same time, however, the unit price of interstate long-distance greatly influences the demand. Consequently, the toll-to-local subsidy begets losses in efficiency in the billions of dollars[1]. Existing subsidies "also create a pattern of subsidization that does not consistently promote universal service or equitable pricing."[2] The web of interservice subsidies was once sustainable. Today, however, to no one's surprise, the subsidy-laden margins in LEC prices for local access (together with advancements in technology and regulatory sanctions) have attracted significant competition, threatening the source of the universal service subsidy.

[1] J. Hausman, T. Tardiff, A. Belinfante, "The Effects of the Breakup of AT&T on Telephone Penetration in the United States," 83 *American Economic Review* 178 (1993), p. 183.

[2] D. Kaserman and J. Mayo, "Cross Subsidies in Telecommunications: Roadblocks on the Road to More Intelligent Telephone Pricing," 11 *Yale Journal on Regulation* 119 (1994), p. 143.

In the mid-1980s, to correct some of the inefficiency in customer-access pricing, the Federal Communications Commission (FCC) implemented and gradually increased the federal subscriber line charge (SLC), a flat-rate monthly federal charge collected from all end users. The SLC recovers a portion of the interstate nontraffic-sensitive costs of accessing the telephone network (*i.e.*, cost of loop facilities from the LEC's wire center to the customer premises). Thus, the SLC shifts recovery for customer access from the IXCs to the end user. Phase-in of the federal SLC directly reduced LEC interstate access charges, specifically the carrier common-line charge.

At the time, concern developed that the SLC would cause residential customers to disconnect their phone service altogether. Despite strong evidence to the contrary, congressional anxiety mounted to the point that the FCC halted its SLC implementation plan, capping the monthly charge at $3.50 for residential and single-line business customers, and at $6 for multi-line business customers.

Fears of a network exodus proved unfounded. In fact, telephone subscribership actually rose from 91.6 to 93.1 percent between 1984 (when the SLC began) to 1989 (when it was capped). This outcome corroborates econometric estimates indicating that the price elasticity of demand for local service is extremely small. The FCC's assessment of the SLC on end users aligned a portion of customer-access costs with those demanding service, while bringing no harm to telephone penetration levels.

Trimming Interstate Costs

To set the stage for efficient competition, a prudent path would complete the process of fully recovering the interstate portion of traffic-insensitive loop costs via the SLC, and recover fixed interstate *switching* costs in a similar manner. Full recovery of the interstate portion of nonusage-sensitive loop costs would require a average monthly SLC of approximately $5.85 per line (based on Southwestern Bell's 1994 loop costs, which closely reflect the average for the Bell companies). The increase (up $2.35 from the current charge of $3.50) could be phased-in over, say, three years to ease the transition. With the multi-line SLC already capped at $6.00, no increase is needed to fully recover fixed loop costs for multi-line business customers.

The FCC started fixing access charges in the mid-1980s but stopped in 1989, when Congress feared a residential exodus.

In addition to costs associated with the local loop, a portion of the central office switch must be dedicated exclusively to each and every telephone line. The cost of this switch connection does not vary with usage and is recovered most efficiently on a flat-rate basis from purchasers of local telephone service. Southwestern Bell estimates this interstate "switching-port charge" at $0.25 per line per month, based on Southwestern Bell's embedded switching network.

The recommended switching-port charge and SLC increase would go a long way toward reducing the interstate portion of the indiscriminate subsidy to basic local service. Recovering the entire interstate portion of the cost of customer access through federal end-user charges makes possible dollar-for-dollar reductions in LEC interstate access charges billed to IXCs. Since LEC access charges account for nearly half of the cost incurred by IXCs to provide long-distance service, this roll-back would allow significant cuts in long-distance prices. Such reductions, should they occur, would offer consumer gains and actually enhance telephone subscribership.[3]

How much would consumers gain by paying directly for local network access? In economics, this gain is known as consumer surplus, or the difference between the amount consumers would be

The Role of Targeted Assistance

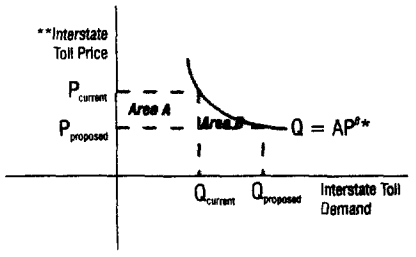
For prices to remain efficient, they must cover marginal cost. To ease the transition to competition, it makes sense to address concern over affordability by targeting financial assistance to those subscribers least able to pay market prices.

Enhancing programs such as *Lifeline* and *LinkUp* can supplement the unravelling of indiscriminate subsidies by waiving the subscriber line charge (SLC) or offering local rate discounts to lower-income customers. Redirecting the gains from efficient pricing could also increase subscriber penetration rates.

For example, eligibility for Lifeline could be expanded to include all households falling below the federal poverty level—a $15,150 annual income for a family of four. From the eligible household universe, I assume that 70 percent of non-*Lifeline* households currently with telephone service would switch to lower-priced lifeline service, and 50 percent of eligible households currently without telephone service would subscribe. Given these assumptions, I estimate *Lifeline* enhancement would cost $50 million per month.

[3]Hausman *et al.*, p. 179.

willing to pay overall for a given quantity of service and the amount that consumers actually do pay. The objective is to isolate the net gain in consumer surplus resulting exclusively from lower interstate long-distance prices brought about by lower interstate access prices (assumed to be fully passed through to consumers). The figure below displays the consumer surplus and shows clearly that consumers in the aggregate can benefit from lower access and long-distance rates.



Consumer Surplus = Area A+ Area B- Increase in End User Charges

*Assumes interstate toll price elasticity of demand (β) equals –.72. (A 10-percent price cut boosts toll usage by 7.2 percent.) This assumption falls within the estimated range of (–.50 to –1.25) toll price elasticities.[4]

**Assumes that access-charge reductions are fully and uniformly passed through to basic residential interstate long-distance price (estimated at 16 cents per minute). To the extent that IXCs do not reduce their basic residential rate, consumer surplus would shrink.

Area A represents the bill savings enjoyed by consumers who purchase an unchanged amount of interstate toll at a lower price per unit. But because these consumers will find interstate long-distance service a better value at the lower unit price, they will buy more long-distance minutes, reflecting a response in demand (β). *Area B* mathematically captures the net gain in value a consumer derives from the additional toll purchase, despite the increase to his or her aggregate toll bill. The total gain in consumer surplus equals the net bill reduction from a static amount of interstate toll purchased at the lower unit price (*Area A*) plus the increased value from greater toll use prompted exclusively by the reduced unit price (*Area B*). From the estimated gain in consumer surplus, I subtract the price increase consumers would experience through the higher SLC and switching-port charges. The difference represents the net gain in consumer surplus flowing from the interaction of lower interstate toll prices made possible by the switching-port charge and increased SLC.

The Larger Implications

This example suggests a total nationwide net gain in consumer surplus of about $625 million each month—over $7.5 billion annually. The net monthly gain in consumer surplus comes to about $4.20 for the average residence and business subscriber, after subtracting the $2.60 monthly end-user increase (a $2.35 SLC increase and $0.25 switching-port charge).

Universal service is best preserved through price rebalancing that focuses assistance on lower-income subscribers.

About $570 million of this surplus, $3.80 per subscriber, is enjoyed as toll-bill savings (*Area A*); the remainder reflects increased value from the purchase of additional, lower-priced interstate toll (*Area B*).

Overall consumer gains remain impressive when interstate price rebalancing is supplemented by expanded assistance *(see sidebar on page 27)* for lower-income subscribers: about $580 million each month, or nearly $7 billion annually, with net surplus gain per subscriber averaging around $3.90 per month. The average residential subscriber would realize a net toll-bill reduction of about $3.50 per month *(Area A)*.

Admittedly, not every customer benefits from the move toward pricing efficiency. Consumers would benefit only if they gain more from a lower interstate long-distance rate than they pay for the switching-port charge and the higher SLC. The more interstate long distance a customer uses, the greater the consumer surplus. Though the data used in this study are too aggregated to permit distributional analysis, telephone spending patterns indicate that net "gainers" represent a healthy portion of all customers.

A previous study that examined actual customer bill data indicated that about 45 percent of Southwestern Bell's residential customers experienced a net bill reduction under the current SLC program; most of those who did not saw only minor increases.[5] Interstate long-distance usage increased substantially in response to significant long-distance price cuts—from 11 to 13 percent annually—when the FCC phased-in the SLC during the mid-1980s. With even wider use of long-distance services expected through the end of this decade, a greater portion of customers should derive increased value from more efficient pricing. Moreover, telecommunications demand studies emphasize that properly structured lower-priced alternatives—*e.g.*, lifeline service, local measured service—can mitigate the threat of higher local-service rates.[6]

continued on page 32

[4]L. Taylor, *Telecommunications Demand in Theory and Practice*, Boston: Kluwer Academic Publishers, 1994.
[5]Larson, Makarewicz and Monson, "The Effect of Subscriber Line Charges on Residential Telephone Bills," 13 *Telecommunications Policy* 337 (1989).
[6]L. Taylor, *supra*, p. 107.

Table 2. Using the elasticities estimated by Lewis Perl,[14] Table 2 gives the predicted changes on telephone subscribership for 1990 to 1993—the period during which LMS was mandatory statewide in Illinois. Table 3 compares predicted to actual yearly (and cumulative) changes in telephone subscribership.

For 1990, the expected change in telephone subscription would range from –0.612 to –1.836 percent. By 1993, when additional rate increases had taken hold in the downstate non-MSA1 region, one would have expected a higher overall change in subscribership rates for the combined regions—somewhere between –0.837 and –2.514 percent. Nevertheless, the actual cumulative percentage change in actual telephone subscribership for 1990 to 1993 in all three regions was only –0.274. This figure is three to nine times smaller than the predicted decline.

Moreover, the disparity between actual and predicted declines in penetration rates may actually be understated. When LMS and flat-rate service were both available, high-volume callers could be expected to opt for flat-rate service, with low-volume callers choosing LMS. Thus, with the mandatory switch to LMS, the move away from flat rates would affect a high proportion of high-volume callers, and thus create an apparent price increase larger than expected and imply a greater drop in household penetration. But on the other hand, high-volume callers are not likely to leave the network.

The experience with mandated LMS in Illinois indicates that the impact of rate restructuring is considerably less than might be expected. In part this conclusion is due to the fact that LMS keeps telephone access prices low in absolute terms. Nevertheless, no statistically significant changes occurred in Illinois' household telephone penetration rates.

Several other factors may also explain this disparity: reduced long-distance rates,[15] an increase in the demand for complementary services available through the telephone network, and a general trend of rising incomes. Whatever the reasons, the Illinois experience demonstrates that telephone rates for residential customers can be restructured to reduce subsidies with minimal impact on universal service. ▼

Peter K. Pitsch is a communications attorney and an adjunct fellow at both The Hudson Institute and The Progress and Freedom Foundation. David P. Teolis is a PhD candidate in economics at Indiana University.

[14]The elasticity estimates are based on the Perl study assuming an initial penetration rate of 93 percent—approximately the level of penetration in Illinois in 1990. *See* Taylor (*supra*, note 7), p. 93.

[15]See, Hausman, Jerry, Tardiff, Timothy, and Belinfante, Alexander, "The Effects of the Breakup of AT&T on Telephone Penetration in the United States," *American Economic Review*, Vol. 83, No. 2. (May 1993), pp. 182-83. The authors claim the SLC accounts for approximately one-third the average price of measured-rate basic access. Accordingly, using own-price elasticity, increases in the SLC would lead to a predicted decline in penetration. They determined that lower long-distance rates worked a positive effect on penetration of approximately three times the magnitude of the increase in basic exchange access prices. For Illinois, the local line charge makes up a larger percentage of the basic access price. Thus, lower intra-MSA toll calls over the same period also had a positive effect on penetration by mitigating the negative impact of higher basic-exchange access prices due to increases in the local line charge.

Efficient Telecom Pricing

continued from page 28

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Debate persists over whether LEC access reductions are completely passed through to lower interstate long-distance rates. But it remains uncontested that access-subsidy reductions not passed through to lower long-distance prices diminish consumer welfare. There is no societal advantage to access-subsidy reductions that simply amount to a wealth transfer from local telephone customers to IXCs. If market forces in the long-distance industry do not dictate that significant input-cost reductions result in output price reductions, then measures to impose the discipline of competition must be taken: 1) Preferably, allow more formidable competitors (*e.g.*, the regional Bell operating companies) to compete freely in interLATA long distance; or 2) mandate flow through to lower the basic residential long-distance rate via regulation.

If the current system of indiscriminate subsidies is left in place, economically efficient competition in telecommunications will never fully develop. ▼

Thomas Makarewicz is area manager of access planning for Southwestern Bell Telephone in St. Louis, MO. *The author gratefully acknowledges the collaboration and expertise of Terry Schroepfer in developing the results used in this article, as well as the constructive comments provided by Darryl Howard, Steve Parsons, and Margret Starkey. This article does not necessarily represent the opinions, policies, or business plans of SBC Communications Inc. or any of its subsidiaries.*

SUMMARY OF STATE LEGISLATIVE AND REGULATORY INITIATIVES IN DISTANCE LEARNING AND TELEMEDICINE IN SWBT STATES

ARKANSAS

The most recent Arkansas Stipulation and Agreement called for the following:

> "SWBT shall commit the necessary investment and expenses to establish a Distance Learning Network linking over 675 educational institutions and locations in SWBT exchanges through the state. This network will provide video and/or digital data connectivity to the state's 18 four-year colleges, 31 two-year colleges, technical, and vocational schools, 39 continuing education centers, 137 high schools, and 453 K-8 schools which are located in SWBT territory. In addition, SWBT shall commit the necessary investment and expenses to establish a Rural Medical Network that will link approximately 55 regional and rural hospitals and health care facilities located in SWBT territory via digital technology." This will enhance the existing T1 compressed video applications being used by the UMAS teaching facility for medical training applications in remote locations.

KANSAS

In the legislative extension of TeleKansas SWBT was ordered to make the following improvements for education and medicine:

> Capital expenditures above normal construction investment, of not less than $64,000,000, in a manner and amount to be determined between SWBT and the Commission. Such additional capital expenditures shall include, but not be limited to the completion of a fiber optic network for public high schools in the areas served by SWBT in Kansas.

In the proposed Kansas legislation, currently being debated in the House, the bill calls for:

> the development of a statewide telecommunications infrastructure that is capable of supporting applications, such as public safety, TeleMedicine, services for persons with special needs, distance learning, public library services, access to Internet providers and others.

the bill also states that:

> the Commission shall authorize all telecommunications service providers to provide residential customers, educational institutions and public libraries lacking toll-free access to the Kansas City, Wichita or Topeka metropolitan areas, dial-up access to one Internet provider within the calling customers LATA for a flat monthly fee. The dial-up access provided shall support at least 28.8 kilobit per-second service to all public libraries, public education institutions, the dial-up access to all other customers shall support at least 14.4

> kilobits per-second service. Customers may request either off-peak or twenty-four hour service. For off-peak users, the flat monthly fee shall apply to access between the hours of 5 p.m. and 7:59 a.m. weekdays and all hours on weekends and federal holidays. The flat monthly fee shall not exceed $15 per-line per-month. For customers who subscribe to twenty-four hour service, the flat-monthly fee for unlimited use shall not exceed $30 per-line per-month.

At the present time many of the school districts are using analog video on fiber and satellite uplinks to Kansas State University to enhance their facilities.

MISSOURI

The settlement agreement reached between SWBT and the Commission calls for the following:

> The agreement calls for the company to invest $275M a year, of which $35M will be earmarked to create a fiber optic cable network in every community it serves and bring distance learning and TeleMedicine applications to as many as 75 accredited schools or hospitals each year. SWBT will also create at least five TeleCommunity centers for interactive video telecommunications before 1999.
>
> Several trials are taking place dealing with distance learning and TeleMedicine, and the first TeleCommunity center is scheduled to open this year.

The current bill in the House calls for:

> In order to facilitate or complement telecommunications, local exchange telecommunications companies may file with the commission tariffs for the provision of local service to public school districts, library districts and accredited primary and secondary private schools, to be at rates less than charged for business and residential service in effect when the tariff is filed, provided that the proposed rates may not be below the actual cost of providing the service.

OKLAHOMA

The settlement agreement reached between SWBT and the Commission calls for:

- Free long-distance access to Internet connections for up to three years for schools, libraries, and universities, totaling about 30M
- Contributions of $1M a year for three years to a state-administered education fund to purchase services for distance learning
- $1.9M for the establishment of at least 20 telecommunications centers throughout the state

The State of Oklahoma already has several distance learning project underway with Oklahoma

State University satellite and fiber-optic network, and school districts in Broken Arrow, Duncan, and Grady County.

There are a number of TeleMedicine projects in planning or underway in Oklahoma linking rural hospitals and medical centers to larger hospitals in the urban areas.

TEXAS

The recent legislation passed in Texas calls for:

> A commitment to offer services on a special contract basis to certain public entities (e.g., schools, hospitals, libraries). The electing company is required upon request, to provide services at 105% of Long Run Incremental Cost, including installation. There is no absolute dollar figure for this commitment. A toll-free dialing arrangement for Internet access is also provided.

There are several private telecommunication networks delivering educational services and information to the school districts. Most deal with the community colleges and universities.

There are also several TeleMedicine programs in progress.

- Illustrative -

Affordability Benchmark

Universal Service Household Expenditures Equal to 1% of State Median Household Income

(1993 Dollars)

State	Median Household Income (1)	Universal Service Household Expenditures	Interstate Benchmark
Arkansas	$23,039	$19.20	$6.00
Kansas	$29,770	$24.81	$6.00
Missouri	$28,682	$23.90	$6.00
Oklahoma	$26,260	$21.88	$6.00
Texas	$28,727	$23.94	$6.00

(1) U.S. Bureau of the Census CD-ROM, Income and Poverty: 1993

ANALYSIS AND COMPARISON OF
BENCHMARK COST MODEL

This analysis was performed to quantify the effects of utilizing the Benchmark Cost Model (BCM)[1] on individual study areas (each companies operating area in a state is considered a study area). Universal Service Fund (USF) data from the October 1995 submission of actual 1993[2] is used to compare to the output of the BCM. The BCM was rerun to eliminate the switching component of the data in order to provide a comparable set of data. The switching component was eliminated by "zeroing out" the switching variables for the "Per line switch cost " and the "Fixed Cost per switch" in the output worksheets of the BCM. The model was the recalculated and the output extracted and summarized using the company name in the BCM. The company name was used to cross reference the BCM data to the corresponding USF data. Although in the majority of cases corresponding data was identified, there were some instances where there was data in either the USF or BCM data and not in the other. These differences are explained later herein.

There are a number of basic differences in the underlying data that should be identified. These are:

- The USF data includes both residence and business lines. The BCM uses only the number of households from the Census Bureau data. For this reason, comparisons were made between the USF information per loop and the BCM information per household.

- The USF data is based on the average for the entire study area. The BCM is based on computations at the census block group level and summed up to the wire center identified as being the closest and then summed to the company owning the wire center.

- The USF data is based on actual data from the individual company's records and books. The BCM data is based on a combination of Census data, material cost, architecture, technology, and other model assumptions regarding impact of terrain and placement costs.

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[1] The Benchmark Cost Model was developed by MCI, Sprint/united Management Co., NYNEX, and US West, Inc., Benchmark Costing Model: A Joint Submission, Copyright 1995, CC Docket No. 80-286 (Dec. 1, 1995).

[2] The 1993 data used here was originally submitted in October of 1994. The October, 1995 submission included this revision of 1993 data. This data includes both "cost" and "average schedule" companies. "Cost" Companies are indicated "C" and average Schedule companies are indicated by an "A" in the Attachments. Because the average schedule companies only provide a limited amount of data, some of the comparisons may not be meaningful for these companies.

NUMBER OF STUDY AREAS IN ANALYSIS

There was a total of 1511 study areas included in the analysis. Since the BCM associated each census block group (CBG) with the closest wire center, some CBGs were associated with wire centers and study areas in neighboring states. Two examples will suffice. The Texas USF data included Border to Border communications while the BCM did not assign any costs to that company. The BCM assigned the estimated costs for two CBGs to a wire center in Texas operated by Southwest Arkansas Telephone Coop Inc., which is not a separate study area in Texas in the USF data, but is included as part of the same companies operations in Arkansas. The major types of differences are identified in the table below:

	USF Data	IN BCM Not in USF	BCM Data	IN USF Not in BCM	TOTAL Analysis
	a	b	c	d	e
"Cost" Study Areas	795	na	763	32	795
"Average Schedule" Study Areas	616	na	589	27	616
Other Study Areas	0	100	100	0	100
Total Study Areas	1,411	100	1452	59	1511

Differences may also be due to acquisitions/sales of companies/exchanges or it may be due to mapping inconsistencies.

DESCRIPTION OF COMPARISONS

ANALYSIS 1

This Analysis provides a comparison of the average USF loop investment per loop to the BCM average loop investment per household by company. For the BCM the investment for each CBG was summarized by company and divided by the total number of households. This comparison shows that there are significant differences for any individual company. Even at a state level, the differences range from the BCM data being 49.6% higher to 68.9% lower than the actual USF results.

ANALYSIS 2

Analysis 2 is a comparison of the average USF cost per loop to the BCM average cost per household on a company-by-company basis. The USF data is taken from the October 1995 submission of 1993 data. The BCM loop cost for each CBG was summarized by the company identifier and divided by the total number of households to determine an average BCM cost per household. Summaries were prepared for each state[3] and the individual state averages combined. Charts show the number of companies that have differences in cost in various bands. For example, for 336 companies (22% of the total companies) the BCM average cost per household is between 50% and 100% greater than the USF average cost per loop.

ANALYSIS 3

Analysis 3 is a company-by-company comparison of the USF Annual Payment to the amount of support calculated using the BCM at two different scenarios which reflect the highest and lowest total amounts from the BCM. The first scenario, which produces the highest amount of support of the three benchmarks ($20, $30, and $40) and two annual cost factors (ARMIS is the highest at 31.6765% and MCI/Hatfield is the lowest at 22.97%), is based on a $20 benchmark and the ARMIS-based annual cost factor. The second scenario produces the lowest amount of support and is based on a $40 benchmark and the MCI/Hatfield annual cost factor. Summaries show that the USF Annual Payment, for the studied companies, is approximately $686 Million. The support requirement grows to $4,733 Million in the BCM using a $20 benchmark and the ARMIS annual cost factor, while with a $40 benchmark and the MCI/Hatfield annual cost factor the support is $848 Million. It should also be noted that the distribution of the support amount varies significantly from scenario to scenario. While the USF provides only 9.1% of the total to Tier 1 Local Exchange Carriers (LECs) (the RBOCs), the support to Tier 1 LECs increases to 41% of the total in Scenario 2 and is 37% in Scenario 3.

ANALYSIS 4

Analysis 4 compared data from SWBT Texas wire centers to summarized results from the BCM. The SWBT actual data[4] reflects investment for the loop only and the BCM data was rerun to exclude switching investment. This comparison shows that the theoretical BCM investment was at least 25% different than the actual investment in 85% of the wire centers.

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[3] Information for each study area within a state was included in and Ex Parte by SWBT in CC Docket No. 80-286 dated 2/14/96, Revised 2/19/96.

[4] Information on SWBT's original study was included in its Comments to the NPRM/NOI in CC Docket No. 80-286, dated October 10, 1995, Appendix 7 and Appendix 8

COMPARISON OF USF LOOP INVESTMENT PER LOOP TO BCM LOOP INVESTMENT PER HOUSEHOLD

BCM results were summarized to provide average loop investment per household for each study area. For comparability with USF data switch costs were excluded.

Universal Service Fund (USF) data from 1993 (data submission was made in September, 1995) was summarized to show average loop investment per loop for each study area.

Difference between BCM average investment per household and USF average investment per loop was calculated.

Difference was compared to the USF average investment per loop.

Average schedule study areas and those study areas not having both BCM investment and USF investment were excluded from comparison. Comparison was made for 761 study areas.

EXAMPLE - SWBT - TEXAS:

BCM	=	$506.14/HH	
USF	=	$890.56/Loop	
DIFFERENCE	=	-$384.42	
% DIFFERENCE	=	(-$384.42/$890.56) =	-43%

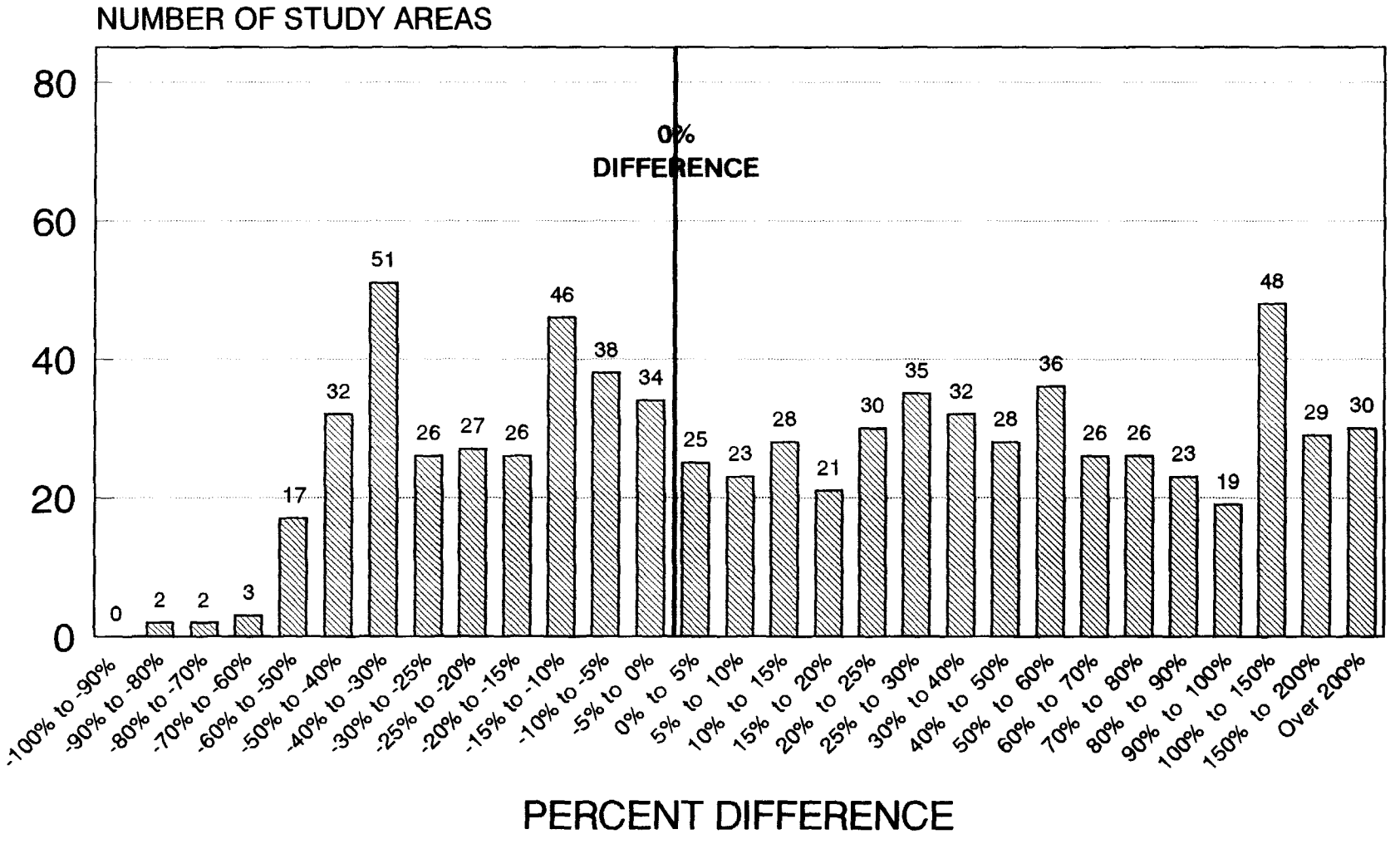
SUMMARY OF RESULTS:

	STUDY AREAS	% STUDY AREAS
-100% < BCM DIFF. <= -50%	24	3%
-50% < BCM DIFF. <= -25%	108	14%
-25% < BCM DIFF. <= 0%	170	22%
0% < BCM DIFF. <= 25%	127	17%
25% < BCM DIFF. <= 50%	95	12%
50% < BCM DIFF. <= 100%	130	17%
100% < BCM DIFF.	107	14%

IMPLICATIONS:

- **RESULTS VARY SIGNIFICANTLY FROM COMPANY TO COMPANY**

DISTRIBUTION OF DIFFERENCES BETWEEN ACTUAL INVESTMENT PER LOOP AND BCM INVESTMENT PER HH



UNIVERSAL SERVICE FUND DATA
COMPARED TO
BENCHMARK COST MODEL

	USF LOOP INV/ LOOP	BCM LOOP INV/ HOUSEHOLD	Difference Compared To USF	% Difference Compared To USF
	LOOP ONLY - EXCLUDES SWITCHING			
Total ALABAMA	1,067.20	695.49	-371.71	-35%
Total ALASKA				
Total ARIZONA	912.71	514.49	-398.22	-44%
Total ARKANSAS	1,216.86	913.68	-303.18	-25%
Total CALIFORNIA	733.68	416.09	-317.59	-43%
Total COLORADO	817.08	675.29	-141.79	-17%
Total CONNECTICUT	751.88	436.93	-314.95	-42%
Total DELAWARE	727.96	549.03	-178.93	-25%
Total DISTRICT OF COLUMBIA	233.64	160.93	-72.72	-31%
Total FLORIDA	1050.13	500.99	-549.14	-52%
Total GEORGIA	1144.95	748.69	-396.26	-35%
Total HAWAII	796.04	421.42	-374.62	-47%
Total IDAHO	1087.97	1183.60	95.63	9%
Total ILLINOIS	519.74	478.48	-41.26	-8%
Total INDIANA	772.13	463.98	-308.15	-40%
Total IOWA	679.00	778.31	99.31	15%
Total KANSAS	909.18	856.82	-52.36	-6%
Total KENTUCKY	1047.53	646.04	-401.50	-38%
Total LOUISIANA	1130.63	699.47	-431.16	-38%
Total MAINE	1075.03	916.01	-159.02	-15%
Total MARYLAND	674.78	424.63	-250.15	-37%
Total MASSACHUSETTS	702.14	217.90	-484.24	-69%
Total MICHIGAN	763.53	570.18	-193.36	-25%
Total MINNESOTA	770.30	769.23	-1.07	0%
Total MISSISSIPPI	1276.47	894.01	-382.47	-30%
Total MISSOURI	916.49	738.37	-178.12	-19%
Total MONTANA	1160.42	1624.68	464.26	40%
Total NEBRASKA	781.16	952.56	171.40	22%
Total NEVADA	652.89	802.14	149.25	23%
Total NEW HAMPSHIRE	1191.46	734.55	-456.91	-38%

UNIVERSAL SERVICE FUND DATA
COMPARED TO
BENCHMARK COST MODEL

	USF LOOP INV/ LOOP	BCM LOOP INV/ HOUSEHOLD	Difference Compared To USF	% Difference Compared To USF
	LOOP ONLY - EXCLUDES SWITCHING			
Total NEW JERSEY	628.20	369.32	-258.89	-41%
Total NEW MEXICO	1117.49	987.52	-129.97	-12%
Total NEW YORK	690.67	348.69	-341.99	-50%
Total NORTH CAROLINA	1013.05	736.62	-276.44	-27%
Total NORTH DAKOTA	1129.67	1382.15	252.48	22%
Total OHIO	699.71	510.04	-189.67	-27%
Total OKLAHOMA	1035.98	652.27	-383.71	-37%
Total OREGON	914.32	748.42	-165.90	-18%
Total PENNSYLVANIA	687.30	472.09	-215.21	-31%
Total RHODE ISLAND	673.53	400.99	-272.53	-40%
Total SOUTH CAROLINA	1216.90	779.75	-437.15	-36%
Total SOUTH DAKOTA	1093.35	1453.07	359.72	33%
Total TENNESSEE	889.28	734.91	-154.37	-17%
Total TEXAS	984.93	642.99	-341.94	-35%
Total UTAH	753.04	749.75	-3.29	0%
Total VERMONT	1288.52	961.26	-327.26	-25%
Total VIRGINIA	829.27	452.58	-376.69	-45%
Total WASHINGTON	866.11	595.26	-270.84	-31%
Total WEST VIRGINIA	1122.70	859.07	-263.63	-23%
Total WISCONSIN	761.51	697.30	-64.21	-8%
Total WYOMING	1697.26	1456.37	-240.90	-14%
SUBTOTAL 49 STATES	829.33	570.58	-258.75	-31%
Excludes Alaska; Includes DC				
TOTAL SUBSET 1	778.76	456.15	-322.61	-41%
TOTAL SUBSET 2	985.09	758.23	-226.86	-23%
TOTAL SUBSET 3	1,403.27	1,570.57	167.30	12%
TOTAL ALL SUBSETS	829.33	566.31	-263.01	-32%

COMPARISON OF USF AVERAGE COST PER LOOP TO BCM AVERAGE COST PER HOUSEHOLD

BCM results were summarized to provide average loop cost, using both ARMIS and MCI/Hatfield Annual cost factors, per household for each study area. Switch costs were excluded.

Universal Service Fund (USF) data from 1993 (data submission was made in September, 1995) was summarized to show average loop cost per loop for each study area.

Difference between BCM average cost per household and USF average cost per loop was calculated.

Difference was compared to the USF average cost per loop.

SUMMARY OF RESULTS:

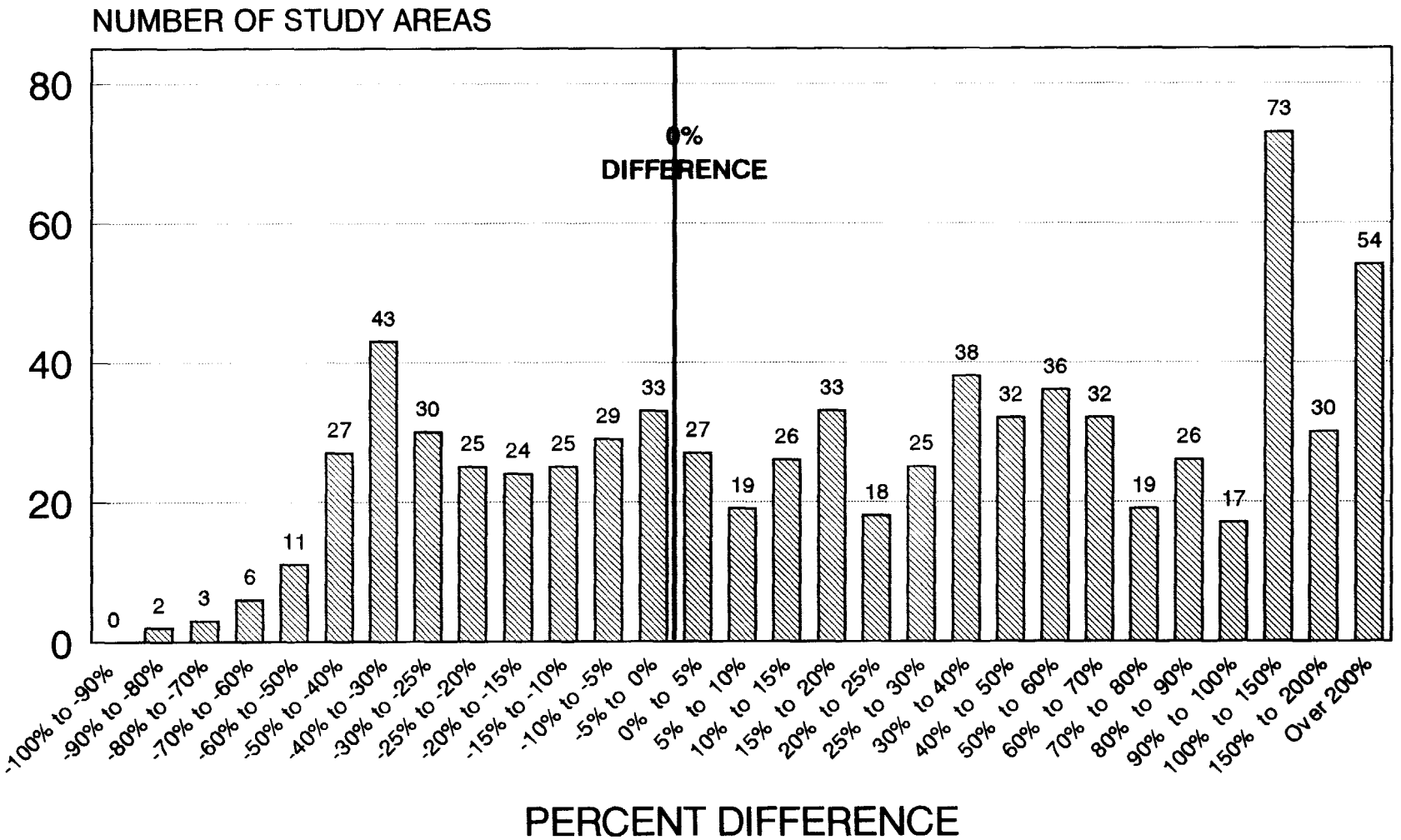
DIFFERENCE BETWEEN BCM AVG. COST/HH AND USF RR/LOOP COMPARED TO USF RR/LOOP	ARMIS ANN. COST FACTOR		MCI/HATFIELD ANN. COST FACTOR	
	COS.	% COS.	COS.	% COS.
-100% < BCM DIFF. <= -50%	22	3%	85	11%
-50% < BCM DIFF. <= -25%	99	13%	189	25%
-25% < BCM DIFF. <= 0%	135	18%	163	21%
0% < BCM DIFF. <= 25%	123	16%	109	14%
25% < BCM DIFF. <= 50%	95	12%	73	10%
50% < BCM DIFF. <= 100%	130	17%	71	9%
100% < BCM DIFF.	157	21%	71	9%

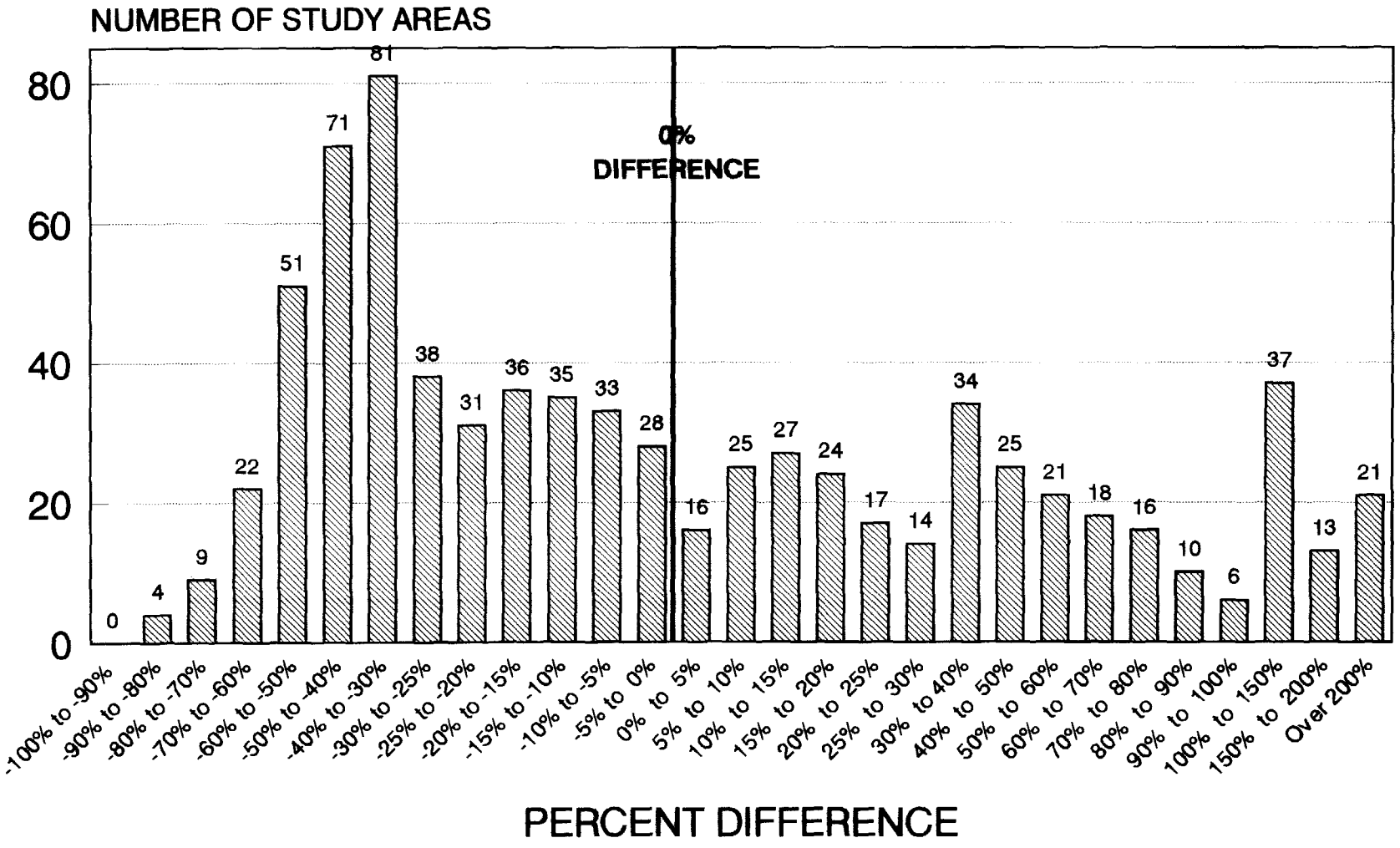
IMPLICATIONS:

- **RESULTS VARY SIGNIFICANTLY FROM COMPANY TO COMPANY**
- **NEED TO DETERMINE WHY SOME COMPANIES COULD RECEIVE SIGNIFICANTLY LESS AND SOME COMPANIES SIGNIFICANTLY MORE BEFORE PROXY IS CONSIDERED FOR IMPLEMENTATION**

DISTRIBUTION OF DIFFERENCES BETWEEN ACTUAL COSTS AND BCM COSTS

BCM - ARMIS ANNUAL COST FACTOR



DISTRIBUTION OF DIFFERENCES BETWEEN ACTUAL COSTS AND BCM COSTS

BCM - MCI/HATFIELD ANNUAL COST FACTOR