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December 3, 1999

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

VIA HAND DELIVERY

Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

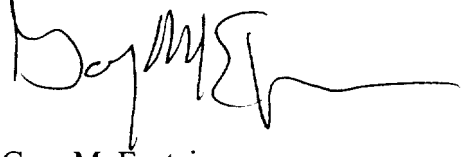
Re: Proposal Submitted by the Coalition for Affordable Local and Long Distance Service ("CALLS") in Access Charge Reform, CC Docket No. 96-262;
Price Cap Performance Review for Local Exchange Carriers, CC Docket No. 94-1;
Low-Volume Long Distance Users, CC Docket No. 99-249;
Federal-State Joint Board on Universal Service, CC Docket No. 96-45

Dear Ms. Salas:

Attached on behalf of BellSouth Corporation is a Study by Dr. Robert W. Crandall and Dr. Jeffrey H. Rohls entitled The Economic Case for the CALLS Proposal. The Crandall/Rohlfs Study provides economic and analytic support for the CALLS proposal.

The Study is submitted by BellSouth Corporation on the date for reply comments in the above-captioned proceeding. BellSouth requests that it be included in the formal record of this proceeding.

Very truly yours,



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THE ECONOMIC CASE FOR THE CALLS PROPOSAL

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December 3, 1999

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Curriculum Vitae

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THE ECONOMIC CASE FOR THE CALLS PROPOSAL

I. EXECUTIVE SUMMARY

The CALLS proposal is an innovative approach for substantially reducing per-minute interstate access prices and combining the existing system of subscriber line charges ("SLCs") and pre-subscribed interexchange carrier charges ("PICCs") into a single charge for residential and single-line business subscribers. It also reduces the combined SLC and PICC for multi-line business subscribers. All of these changes move regulated rates closer to economically-efficient, market-based prices.

The restructuring of rates towards costs is particularly important in the new competitive era for local telecommunications. By increasing residential SLCs, reducing the combined level of SLCs plus PICCs for multi-line business lines, and sharply reducing per-minute access charges, the proposal reduces the artificial incentives for the competitive local exchange carriers ("CLECs") to focus their attention principally on business customers in urban areas and on other subscribers who are intense users of long-distance services. But just as importantly, the proposal increases the incentives for all carriers — entrant and incumbents — to serve residential and rural areas, increasing the likelihood that consumers in these areas will see enhanced choice, service offerings and value from competition. It also reduces the dependence of the incumbent local exchange carriers ("ILECs") on per-minute access charges and business customers, and makes mass market service relatively more attractive.

The substitution of SLCs for PICCs in the CALLS proposal does not, in itself, increase subscriber rates, because the PICCs are currently passed through to subscribers by the interexchange carriers ("IXCs"). Substitution of the SLC for PICC charges reduces transaction costs, which would otherwise be recovered by long-distance companies, most likely in their flat-rated PICC or subscription charges. In the

absence of alternative sources of loops for competing carriers, the PICCs are not "competed away" by the long-distance carriers because they are unavoidable costs of serving pre-subscribed customers. On the other hand, while the increased SLCs will also initially be reflected in the ILECs' monthly bills to their customers, these rates will be subject to downward competitive pressure from the CLECs, whose cost structures are unaffected by this proposal. Moreover, placing these charges in the SLC, which is paid by the end users, rather than the PICC, which is paid by the IXC and then passed on to the end user, increases the transparency of these charges.

The restructuring of rates in the CALLS proposal realigns prices so that they also more closely reflect the cost structure of new packet-switched technologies, which, in turn, creates a rate structure that can more easily make the transition from circuit to packet switching and which increases the incentives for ILECs and entrants to invest in high-speed, broadband services. The rapid growth of data services, including Internet services, creates the need for carriers to substitute packet-switched technology for the current circuit-switched architecture. This substitution involves moving away from a technology in which circuit time can be measured to a technology that transmits bursts of digital bits over "always-on" local circuits. In an "always-on" environment, there are no minutes of circuit time over which to collect implicit support. The "always-on" packet technology therefore requires that the cost of the subscriber's dedicated access line be recovered from subscription (i.e per-line) charges (or, if desired by policymakers, per line subsidy support), not from per-minute charges. The CALLS proposal moves regulated rates in this direction, thereby sending the carriers the appropriate market signals.

Through the substitution of SLCs for PICCs and some deaveraging of these SLC increases, the proposal increases the incentives for ILECs and CLECs to invest in rural areas. Because PICCs are geographically averaged and business PICCs recover part of the cost of serving residential customers, recovery of common-line costs through SLCs rather than through PICCs increases entry and investment incentives in rural and residential markets. The CALLS proposal aligns SLCs more

closely with costs, thereby making investment in existing and new, innovative services in rural areas more attractive to ILECs and entrants alike.

Residential and business consumers alike will benefit substantially from the more efficient pricing policy promoted by the CALLS proposal. Lower-income households will be insulated from the modest increases in the primary SLC because Lifeline subscribers are exempt from these increases, and benefit from the elimination of PICC charges and lower toll bills. The net benefit to residential consumers will be between $1 and $2 billion per year because the benefits of lower consumer long-distance bills that result from the reduced per-minute access charges are far greater than the costs of the modest increase in SLCs.

II. THE CALLS PROPOSAL

The CALLS proposal represents a major step towards economic rationalization of the pricing of interstate telephone services. This proposal will improve economic welfare, reduce uneconomic arbitrage, and spur network investment in new, broad-band service facilities. It reflects an attempt to reduce per-minute access charges first through consumer price-neutral restructuring and later through small increases in average residential and single-line business per-line charges. Business per-line charges (SLCs and PICCs) decline, and urban and rural rates are permitted to vary to a limited extent to reflect underlying costs. It also simplifies the residential and single line business rate structure by combining SLCs and presubscribed PICCs into a single SLC for those customers, and by eliminating pricing differentials between "primary" and "non-primary" residential lines.

Specifically, the CALLS proposal reduces interstate access usage charges to $0.0055 per minute for the Bell Companies and GTE and to $0.0065 per minute for other ILECs — both to be reached through a combination of restructuring of the loop and switching charges and reductions of switching and transport components of switched access charges. Thereafter, until 2005, switched access charges are to be applied at $0.0055 or $0.0065 per minute. The proposed reductions are approximately 50 percent of current switched access charges.

At the same time, the current SLCs and PICCs are replaced by a single SLC, which rises gradually from a maximum of $5.50 — equivalent to what an ordinary, on-line residential consumer would likely pay in July 2000 in combined residential SLC and IXC-billed PICC charges — over three and one-half years to a maximum of $7 for primary residential lines and single-line business lines. CALLS projects that, on average, the primary residential SLC will rise only $0.78 over that period, from $5.37 to $6.15. These increases in residential primary line SLCs do not apply to Lifeline subscribers. At the same time, the non-primary SLC is reduced slightly and also capped at $7 per line. The multi-line business PICC is also reduced and eventually eliminated in most areas over the five-year period. The multi-line business SLC is frozen during the period in which the CCL and PICC are being reduced and eliminated. The CALLS proposal also allows a modicum of geographic deaveraging of SLCs, subject to a number of constraints.

Finally, the CALLS proposal includes a $650 million increase in high-cost universal service support to replace $650 million of support implicit in interstate access charges. This support (as well as the additional Lifeline support) is portable, providing an entry incentive for CLECs, and is recovered through universal-service fund contributions by all providers of interstate telecommunications.

III. MOVING TOWARDS ECONOMICALLY EFFICIENT PRICING

Economic efficiency is an important consideration in setting interstate telecommunications rates. The economic losses from inefficient pricing, in terms of lost productivity and competitiveness, grow dramatically as competition intensifies. Regulatory policies that mandate inefficient pricing also dilute incentives to invest in new telecommunications technologies, such as digital subscriber-line ("DSL"), and in infrastructure in unprofitable areas. They also provide artificial incentives for entrants to exploit arbitrage opportunities by targeting customers who are paying regulated prices that are far above cost — particularly business subscribers in urban areas — while diminishing incentives to offer service in areas where regulated rates are below cost, particularly in rural areas and in most residential areas. They can therefore have

a devastating long-run impact on the growth of the telecommunications sector and on economic growth opportunities that depend upon a robust and innovative telecommunications infrastructure. This is particularly true with respect to e-commerce and other Internet-based services, all of which can continue to grow and develop if bandwidth in the "last mile" increases throughout the country.

The CALLS proposal should be evaluated in light of the requirements for efficient pricing and its effect on network investment. To do so, we address the following issues:

- How should regulated rates be structured to reflect the economics of current and new technologies?
- How do current rates violate these requirements, and what are the harmful effects of the failure of regulated rates to reflect these requirements?
- How would the CALLS proposal create economic benefits in both the short and long run?

A. The Theory of Economically-Efficient Pricing

The requirements for economically efficient prices are well known. In most industries, prices should equal marginal costs. Since our focus here is on long-run policies, the relevant marginal cost is *long-run* marginal cost ("LRMC"). However, in telecommunications and other industries where economies of scale and/or scope are important, marginal-cost pricing of all services provided by the network provider does not cover the total costs of building, operating and maintaining the network and is therefore not feasible in the long run. As a result, all services must be marked up over marginal cost so that the firm covers its total costs, including its cost of capital but the markups should be relatively small on the services whose demand is most price elastic. The gains from efficient pricing accrue because:

- Productivity of the telecommunications sector increases as suppliers produce and sell more of the elastic services whose prices have declined. The suppliers thereby enjoy greater scale economies;

- Firms that consume more of the lower-priced elastic services lower their costs and become more competitive; and
- There is an improvement in the economic welfare of consumers who use more of the lower-priced elastic services and the welfare of those with whom they communicate.

As competition intensifies, demand facing the supplier becomes more elastic in competitive markets. Regulated rates that reflect large markups above marginal cost in those markets lead to greater loss of economic efficiency — perhaps much greater — than without competition — and even to lower carrier profits as the carrier loses market share to competitors.

B. Inefficiency of the Current Rate Structure

The current structure of ILEC rates does not meet the requirements for economic efficiency. Access services and other price-elastic services are priced above competitive levels while local residential rates are held below economically efficient levels, particularly in rural areas. At the same time, local business rates are often set far above LRMC to recover the losses from serving residential customers. Interstate per-minute access charges are still above their competitive levels despite 15 years of Commission policy to reduce them through a combination of SLCs and price caps.

The current regulatory rate structure leads in several different ways to enormous losses of economic welfare. First, it discourages efficient investments by ILECs and CLECs in rural areas and creates artificial incentives for CLECs to target business customers while delaying or foregoing entry into residential areas. Second, it reduces the incentives for ILECs to invest in important new technologies, such as packet switching and DSLs, because of the ILEC's need to protect revenue flows from usage-sensitive access charges. Finally, it sends the wrong signals to subscribers on the cost of network access and use, reducing network usage (calling) and, therefore, the total value of telecommunications services.

C. The CALLS Proposal Increases the Efficiency of the Rate Structure

By reducing per-minute access charges, combining the existing system of PICCs and SLCs into a single SLC, reducing multi-line business SLCs, and permitting a limited amount of geographic deaveraging of the SLCs, the CALLS proposal moves the regulated rate structure in a direction consistent with the requirements for economically-efficient pricing. The reduction of per-minute access charges clearly moves them toward their economically-efficient levels. The proposal raises primary residential per-line rates modestly while reducing multi-line business rates, a change that is generally consistent with relative LRMCs. By substituting SLCs for PICCs and allowing some geographical deaveraging of the SLCs, the proposal also allows rates more accurately to reflect the differences in the cost of serving areas of different population densities.

Some have expressed concern that a substitution of SLCs for the combined SLCs and PICCs in the current rate structure will unfairly penalize consumers because the PICCs can be "competed away" by the rivalry among interexchange carriers while the SLCs will not be subject to such competition.[1] This concern reflects a fundamental misunderstanding of the economic effects of competition and of the CALLS proposal itself.

First, the substitution of SLCs for PICCs recovers the cost of the ILECs' local lines directly from its subscribers, not indirectly through the long-distance carriers. These charges are then a transparent part of the subscribers' direct costs of the ILECs' local services and these rates are subject to competition from the new CLECs, who do not have to charge the SLC but who compete against the full range of ILEC end user charges. This competition will serve to place downward pressure on all local charges, including the SLC. By simplifying the rate structures and making the charges

[1] See, for example, the Comments of the Florida Public Service Commission in this Proceeding.

more understandable, consolidation of these charges facilitates informed choices by consumers of the plan that best fits their needs.

Second, competitive firms must pass on *all* of their costs in order to remain in business. Thus, while rivalry among current long-distance carriers will place downward pressure on prices, it does not lead to prices that are below cost. Every increase in their costs will eventually be passed on to their pre-subscribed customers, perhaps after a relatively short lag. The PICCs cannot be "competed away" because they cannot be avoided by the interexchange carriers — *i.e.*, they are beyond their control. The carriers will simply pass them through to their customers while they focus their energies on lowering those costs over which they have some control.

Finally, allowing the ILEC to collect the charge directly in the form of a SLC rather than requiring a multitude of long-distance carriers to pay PICCs to the ILECs reduces transactions costs. The combination of lower transactions costs and greater transparency of the charges clearly makes the SLC superior to the PICC, ultimately reducing consumer costs and making competition work more efficiently.

IV. THE CALLS PROPOSAL PROVIDES IMPROVED INCENTIVES FOR DEPLOYING PACKET-SWITCHED HIGH-SPEED SERVICES

The CALLS proposal is a substantial step in the right direction because it moves the current rate structure in the direction of economically-efficient pricing. By reducing per-minute access charges while increasing residential and single-line business SLCs and reducing multi-line business SLCs, it creates improved incentives for investment for ILECs and CLECs alike. All these changes are required not only to reflect the cost structure of current services, but also to increase the incentives for carriers to deploy high-speed services over packet-switched networks.

A. Reduced Dependence on Switched Access Charges

Moving rates toward economically efficient levels reduces the ILECs' dependence on switched (per-minute) access charges to recover revenue deficiencies from local residential services and rural services. As a result, the ILECs have a

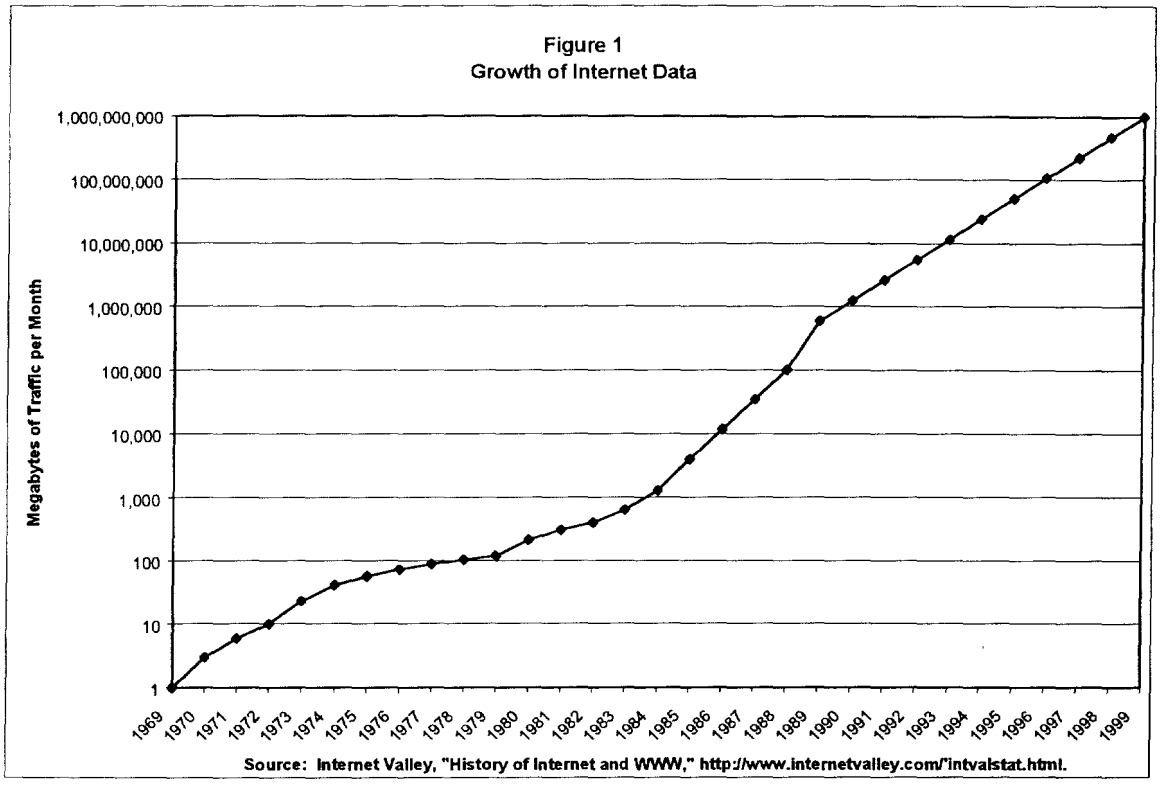
greater incentive to invest in new high-speed broadband technologies that use packet switching and a substitute for the current circuit-switched network. Without the CALLS proposal, the ILECs must rely disproportionately on per-minute access charges to recover revenue deficiencies, thereby making any technology that substitutes for circuit switching much less attractive to them.

The rapid growth of data services, particularly those associated with the Internet, has created a need to build high-speed, packet-switched networks to serve all subscribers, businesses and residences. ILEC networks have already evolved from analog to digital. The interoffice networks are now almost completely fiber optic. However, ILEC offerings continue to consist primarily of dedicated lines and circuit-switched services. Packet switching, the technology of the Internet, is still largely absent on local ILEC networks.

ILEC carriage of data has grown explosively as Internet usage has expanded in recent years. The volume of data transmitted over the U.S. backbone networks in 1999 will top 1 billion megabytes per month. Figure 1 plots the growth of data on the U.S. backbone networks since 1969, the beginning of ARPANET. Note that the vertical axis in the figure has a logarithmic scale, because such a scale is required to track the massive growth. In 30 years, the carriage of data has grown by 9 orders of magnitude.

Packet switching would be cost effective for much of the data communication carried on ILEC networks. Indeed, it is likely that ILECs will eventually offer a variety of data services to business customers, as well as Internet services to both business and residential customers, through a packet-switched architecture. Eventually, voice may also be packetized and transmitted over networks that use a packet-switched architecture. For the present, however, inefficient regulatory policies substantially dilute ILEC incentives to invest in packet switching. As a result, ILECs are likely to deploy packet switching much less rapidly than would be economically efficient. The CALLS proposal would reduce the regulatory disincentives for ILECs to invest in

packet switching and would therefore lead to more rapid deployment and improve economic efficiency.



Both dedicated and packet-switched connections have the advantage of being "always on." Usage is not measured in time, and often not measured at all. Packet services are often sold by peak transmission capacity, *e.g.*, up to 256 KBPS. By contrast, circuit-switched connections require that a dial-up connection be established each time that a call is made and a circuit path be reserved. Circuit switching traditionally has been charged on a per minute basis to reflect the fact that the costs vary with call duration. A packet architecture, however, is fundamentally inconsistent with a regulated pricing system that sets prices on a per-minute basis, particularly one that uses per-minute charges as a source of implicit support for universal service.

B. Effect of the CALLS Proposal on the Deployment of Packet Switching

Large ILEC and CLEC investments in DSL are required to meet the needs of Internet users, who have growing requirements for rapid data transmission. Nevertheless, even apart from regulation, DSL investment involves substantial risk:

- DSL is a discretionary service, and demand may grow less rapidly than expected;
- Cable companies will provide competitive two-way broadband services in many areas; and
- Other technologies (*e.g.,* wireless) may ultimately prove to be more efficient than DSL.

In themselves, these risks might be acceptable, given the potential gains from market success. However, the regulatory impediments that derive from the current pricing structure make ILEC investments in DSL much less attractive. One regulatory impediment is especially relevant to the CALLS proposal; *viz.*, *all* investments in the regulated sector, are made considerably more risky by the prospect that the inefficient regulated rate structure will collapse and with it the means of funding network investment and operations in the high-cost areas. The CALLS proposal moves signify-cantly in the direction of economically efficient pricing for current circuit-switched voice/data services. By moving prices closer to economic costs, it reduces the potential for arbitrage, inefficient entry, and a collapse of the entire regulated rate structure.

Significantly, the CALLS proposal moves rates in the direction required to make investments in new, packet-switched services economically feasible. As subscribers continue to increase their demand for data services, such as those provided through the Internet, they will be communicating with bursts of packets transmitted or received at varying intervals through a connection which is always on. This type of com-munications cannot be supported through the current pricing system in which per-line charges are less than the full cost of the subscriber's dedicated access line with the remainder paid for in large part by per-minute access charges that are priced far above LRMC. In the new data-intensive environment, customers must pay per-line

charges that fully defray the costs of their dedicated line and capacity charges that reflect only the burden that they place on the packet-switched infrastructure in terms of capacity. With packet switching, it is simply not possible to charge for network usage *by the minute*. Given that many new, innovative services are likely to involve packet switching and higher-speed access lines, it is imperative that regulated rates for subscriber access cover the cost of the always-on connection to the packet switch.

By moving the rate structure in an economically-efficient direction and by establishing a mechanism to support universal service outside of access rates, the CALLS plan would create improved incentives for a migration of consumers from circuit switched to packet-switched services. As consumers migrate to packet-services, policymakers would not have to fear that funding for building and operating networks in high cost areas will diminish. Universal service support is no longer a reason to impose per minute rate structures on bursty packet-based services.

In reality, as the CALLS proponents themselves recognize, the CALLS agreement is a transitional step that goes only part way toward solving the problem. Nevertheless, it is a significant step in the right direction. It increases the likelihood that ILECs will deploy packet switching and DSL where they are cost-effective and thereby provide value to customers.

The benefits of the CALLS proposal will be even greater in the future. As technology advances, the incremental cost of interstate access services will decline. This decline may be augmented if packet switching becomes cost-effective for ILECs to use for voice communications. Under these circumstances, moving toward efficient and sustainable rates, as provided in the CALLS proposal, will be all the more desirable. Indeed, it will be critical.

V. THE CALLS PROPOSAL INCREASES INCENTIVES TO INVEST IN RURAL AREAS

The current rate structure provides rural residences with local service at prices that are generally below — and often substantially below — LRMC, requiring ILECs to recover the losses from business customers and from interstate per-minute access

charges. As a result, ILECs have less incentive to invest in rural areas, and the new CLECs are also discouraged from investing in these areas, preferring to target business subscribers in urban areas instead.

Although PICCs are more efficient than per-minute charges, SLCs are more efficient than either and are collected in a manner that is more closely aligned with costs. Because interexchange carriers are forced to average rates geographically, they cannot charge higher rates to subscribers in higher-cost areas to reflect the cost of the PICC. However, the SLC varies across states with the level of non-traffic sensitive costs and therefore contributes to a rate structure that more closely aligned with costs. In addition, the CALLS proposal allows some deaveraging of SLCs *within* states, thereby further moving rates toward economic costs.

By freezing and eventually reducing the current combined level of multi-line business PICCs and SLCs while increasing the single-line residential SLC slowly, the CALLS proposal further reduces the distortions in the current rate structure. This, in turn, reduces the incentives for CLECs and ILECs to target their investments towards urban business customers and to invest in rural areas and in residential portions of urban areas.

One of the most important effects of the innovative CALLS proposal is thus to move the rate structure for *current services* closer to relative costs and to make rural areas more attractive for investment. The current local rate structure, including the PICCs and SLCs, provides much less incentive for ILECs or CLECs to invest in rural areas because a large share of rural residences do not generate sufficient revenues to cover the long-run incremental cost of serving them. As a result, incremental investments by ILECs or new investments by CLECs in these areas earn returns that are simply too low to cover the cost of capital. The CALLS proposal provides for part of the solution to this problem by aligning rates more closely with costs while freezing and even reducing multi-line business rates in all areas. Subscribers in high-cost areas are protected under the CALLS plan by a $7 SLC cap and a new explicit, portable $650 million universal-service fund.

Another way to look at this problem is by examining how carriers recover their costs in rural areas where rates are below cost. Under the current regulatory system, a carrier recovers its costs in these rural areas by serving business customers (particularly in urban areas), from long-distance customers as a portion of access charges, and from some urban consumers whose rates may be above cost. Notably, the carrier does not fully recover its costs by serving the customer in the rural area. Under the CALLS plan, a larger share of the cost of serving the rural areas is defrayed by actually serving the rural area. This would be true for CLECs as well as for ILECs.

VI. THE IMMEDIATE EFFECTS OF THE CALLS PLAN ON CONSUMER WELFARE FOR RESIDENTIAL SUBSCRIBERS

The CALLS proposal conveys substantial immediate economic benefits on consumers of telephone services by rebalancing rates towards costs — benefits that occur even before the effects of the proposal on carrier investments. These benefits derive from the lower marginal cost of interstate calls and substantially exceed the costs of increased SLCs for residential lines. In addition, the proposal insulates low-income subscribers from the higher SLCs because this increase does not apply to Lifeline customers.

Users also benefit from the lower costs of goods and services that result from lower business long-distance rates, particularly in telecommunications-intensive sectors such as travel and finance. The economy benefits because the telecommunications infrastructure is more intensively utilized as long-distance rates fall and incentives for investment in the existing network are improved. Finally, most firms in the telecommunications sector also gain from the rate restructuring in the CALLS proposal. Long-distance companies clearly benefit from the 50 percent reduction in access charges over current levels. The additional long-distance calling increases their cash flows even when retail prices are reduced fully to pass through access-charge reductions.

To estimate the gains from the CALLS plan for residential subscribers,[2] we begin with the assumed impact of the plans on long-distance and local rates. Specifically, we assume that the plan replaces the existing PICCs and results in a SLC plus universal-service charges in 2004 for primary residence lines that are an average of $0.78 per line above the sum of the current SLC and PICC. As a conservative alternative, we also show the effects with a maximum increase of $1.50 per month.[3] We assume that secondary lines' SLCs plus universal-service charges are essentially unchanged in 2004 over pre-existing SLC and PICC levels after adjusting for USF contributions and non pre-subscribed lines. Finally, we assume that interstate access charges are reduced by $0.055 on each end over current levels.[4]

We utilize a model of the contiguous 48 states plus the District of Columbia that has been calibrated for the year 1996. The model has three regions for each state — central cities, suburbs, and rural areas. Each area's population is divided into five income groups. For the purposes of this analysis, half of the lowest income group — households with $10,000 in annual income or less — is reasonably assumed to be exempt from the higher SLCs. The price sensitivity of demand for long-distance declines with rising income levels, and averages -0.7. Similarly, the demand elasticity for primary access lines declines with rising income levels and averages -0.01.

To calibrate the model, we begin with existing local and long-distance rates in 1996. Local rates are increased by $2.40 to account for increasing SLCs and PICCs in the absence of the CALLS plan. Residential long-distance rates, which averaged

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[2] Since business long distance accounts for approximately 60 percent of all long-distance usage and because the lower long-distance rates paid by business will be passed through to consumers in lower prices of goods and services, the total increase in consumer welfare is likely to be more than twice as great as the direct efffect on residential subscribers estimated in this section.

[3] The proposal increases the SLC by an average of $1.63 over the current primary-residence SLC plus PICC. However, there are also increases in USF contributions of $650 million that must be recovered on a per-line basis. Moreover, the Fifth Circuit Court of Appeals has recently ruled that the FCC may not mandate the recovery of USF charges through increases in interstate access charges. This increases the current 1999 "baseline" because the existing USF contributions are now likely to be recovered on a per-line basis.

[4] This is based on the data filed with the CALLS proposal that show that the average access charge per MOU is currently $0.01119.

17.7 cents per minute in 1996, are reduced to 13.3 cents per minute to reflect the price declines of the past three years. In addition, total 1996 long-distance calling is increased by 25 percent to reflect the effects of exogenous growth due to economic expansion.[5] (Later Census estimates are not available.) The number of primary residence lines is increased by 9 percent over the 1996 estimate for growth.

The increase in fixed per-line charges of $1.50 affects households with incomes above $10,000 per year.[6] All households, however, benefit from lower long-distance rates. We assume that the $0.011 per minute reduction in total interstate switched access charges is fully passed through by long-distance carriers, just as the PICCs have been. Since these lower charges affect only interstate long distance which represents 67 percent of long-distance revenues, we reduce long-distance rates by 0.67 times $0.011, or by $0.0074 per minute.

We cannot know with precision what the telecommunications market will look like in 2004 when the CALLS plan is fully effective. We therefore focus our analysis on today's market as the base case. This means, for example, that there is no growth in households, access lines, or minutes of use other than those caused by the changes.

Assuming that all price-cap companies participate, the effect of the CALLS plan at 2004 SLCs and access rates but 1999 levels of access lines and long-distance usage is to improve consumer welfare by between $1.3 billion and $2.1 billion per year (*see* Table 1). This is the minimal estimate since it does not account for the intervening effects of growth or lower long-distance rates between 1999 and 2004. Nor does it account for consumer gains from the lower cost of goods and services created by lower business rates. If in the intervening five years consumer long-distance usage increases by 5 percent per year — or cumulatively by 28 percent — the consumer gains could rise to between $2.2 billion and $3 billion per year.

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[5] Even with this increase, the estimated total residential long-distance spending is $38 billion in 1999. The Census Bureau estimates that residential long-distance spending was $42.8

[6] We assume that half of all households with incomes of less than $10,000 receive the Lifeline exemption from the SLC increase, reflecting the current number of Lifeline subscribers.

Table 1

The Effect of the CALLS Proposal on Consumer Welfare (Billions of $ per Year)

Source	1999 MOU Levels	2004 MOU Levels (=1.28*1999 Levels)
	SLC: +$1.50	
Long Distance Services	$3.03	$3.91
Local Services	-$1.73	-$1.73
Total	$1.30	$2.18
	SLC: +$0.78	
Long Distance Services	$3.03	$3.91
Local Services	-$0.90	-$0.90
Total	$2.13	$3.01

VII. CONCLUSIONS

The CALLS proposal is a sorely needed step towards improving the current inefficient pricing structure of interstate telecommunications. The adoption of the proposal would improve local carriers' incentives to invest in rural areas, speed the adoption of high-speed, packet switched services, and improve economic welfare. Indeed, we have found that the proposal, under conservative assumptions, will improve consumer welfare by at least $1.3 billion per year. In a world that is moving towards the "Information Age," the CALLS proposal will lead to a regulated pricing structure that is more compatible with new packet-switching technologies.

The CALLS proposal will also create greater incentives for incumbents and entrants alike to invest in rural and residential areas. It will simplify the current regulatory structure for collecting per-line charges. It will accelerate the deployment of new packet-switched DSL technologies by entrants and incumbents alike.

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Invited participant in FCC Workshop on Validation of Cost Models. January 16, 1997.

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"Design of Spectrum Auctions." Presented at the Annual Meeting of the IMF and World Bank Group. Washington, D.C. 1996.

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"The Present Status of Research on Network Economics." Presented to the Institute for Posts and Telecommunications Policy. Tokyo, Japan. July 20, 1990.

"Comment on Incremental Capital Costs of Telephone Access and Local Usage." Presented at the 20th Annual Williamsburg Conference. Williamsburg, Virginia. December 1988.

"Aggregate Consumers' Surplus: No Apology But Some Caution." Presented at Stanford University and University of California. Berkeley, California. January 1982.

"Return for Risk and the Term Structure of Interest Rates." Presented to the Econometrics Society. Dallas, Texas. 1975.

"Analysis of Demand for Video Communication." Presented at Second Annual Telecommunications Policy Research Conference. Airlie, Virginia. 1974.

OTHER CONSULTING ASSIGNMENTS

Advisor to Telstra (Australian national carrier), 1994-1999.

Advisor to OSIPTEL (Peruvian telecommunications regulator), 1996-1999.

Advisor to Office of Utilities Regulation, Jamaica, W.I., on establishing a regulatory framework for the telecommunications sector, 1996-1997.

Advisor to Comisión Nacional de Telecomunicaciones — CONATEL (regulatory authority in Honduras), on drafting service-specific regulations for telecommunications services, 1998.

Advisor to CONATEL on drafting service-specific regulations for telecommunications services, 1998.

Advisor to Superintendencia de Telecomunicaciones (regulatory authority in Bolivia), on resolution of interconnection dispute, 1997.

Advisor to City of San Diego, California, with regard to negotiations involving spectrum licenses, 1996.

Advisor to *Secretaria de Comunicaciones y Transportes* (Mexican telecommunications regulator) under auspices of the World Bank and Inter-American Development Bank, 1989-1990.

Advisor to the New Zealand Treasury and Ministry of Commerce with regard to the privatization of Telecom New Zealand, 1989.

Advisor to Aussat (Australian satellite-telecommunications operator) with regard to interconnection issues, 1990.