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January 26, 1996

BY HAND DELIVERY

Ms. Blanca S. Bayó
Director, Records & Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 950985-TP (Sprint)

Dear Ms. Bayó:

Enclosed for filing on behalf of MCI Metro Access Transmission Services, Inc. (MCImetro) in the above referenced docket are the original and 15 copies of Dr. Nina W. Cornell's rebuttal testimony.

By copy of this letter this document has been provided to the parties on the attached service list.

Very truly yours,

Richard D. Melson

RDM/cc
Enclosures
cc: Parties of Record

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing was furnished to the following by hand delivery (**) or next business day delivery by UPS (*) this 26th day of January, 1996.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DIRECT TESTIMONY OF

DR. NINA W. CORNELL

ON BEHALF OF

MCI METRO ACCESS TRANSMISSION SERVICES, INC.

DOCKET NO. 950985-TP

PETITIONS OF CONTINENTAL AND TIME-WARNER

RE SPRINT-UNITED AND SPRINT-CENTEL

JANUARY 26, 1996

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is Nina W. Cornell. My address is 1290 Wood River Road, Meeteetse, Wyoming 82433.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND AND EXPERIENCE.

A. I am an economist in private practice, specializing in microeconomic analysis of regulatory and antitrust issues. Until late 1988, I was with the firm of Cornell, Pelcovits & Brenner Economists Inc., of which I was president.

Before entering private practice, I was Chief of the Office of Plans and Policy, Federal Communications Commission (FCC). As Chief of the Office of Plans and Policy, I served as chief economist to the Commission and participated in virtually all FCC agenda meetings.

Prior to being associated with the FCC, I was the Senior Staff Economist for regulatory, transportation, environmental, and health and safety issues for the Council of Economic Advisers (CEA). In this position I reported directly to Charles L. Schultze, Chairman of the Council.

Prior to being with the CEA, I was employed as an economist with the Council on Wage and Price Stability, where I served on the Task Force on Reform of Federal Energy Administration Regulations. Before joining the Federal Government, I spent four years at the Brookings Institution as a Research Associate. I am a graduate of Swarthmore College, and received my Ph.D. in Economics from the University of Illinois in 1972.

Q. HAVE YOU PUBLISHED ANY PAPERS ON TELECOMMUNICATIONS?

A. Yes. I have published a number of papers on the regulation of telecommunications as well as on other regulatory and natural resource issues. A list of my publications is contained in my resume -- Exhibit ____ (NWC-1).

Q. HAVE YOU TESTIFIED BEFORE?

A. Yes. I have served as an expert witness in several court and a number of regulatory proceedings, particularly proceedings involving telecommunications issues. I have also testified before various committees of the US Congress. A list of my testimonies is also contained in my resume.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. My rebuttal testimony responds to the testimony filed by Mr. Poag for Sprint-United and Sprint-Centel (Sprint). In particular, my testimony responds to Mr. Poag's testimony regarding 1) what are the appropriate rate structure, interconnection rates, or other arrangements for the exchange of local traffic between ALECs and Sprint; 2) what are the appropriate rate structure, interconnection rates, or other arrangements for the exchange of toll traffic between ALECs and Sprint; 3) what are the appropriate arrangements for physical interconnection between ALECs and Sprint; and 4) what are the appropriate arrangements for the delivery by Sprint of calls originated by and/or terminated to ALECs from other carriers (IXCs, other ALECs,

other LECs, wireless carriers) that are not directly connected to the ALEC. I also briefly address Mr. Poag's proposal to charge special access rates for unbundled local loops and respond to several other statements with which I disagree.

I recommend that the Commission order Sprint to treat ALECs as co-carriers, and terminate local traffic that originates on the networks of ALECs using Mutual Traffic Exchange, rather than either of the compensation methods recommended by Mr. Poag. I also recommend that toll traffic be exchanged with the payment of switched access charges. ALECs should be allowed to file their own switched access tariffs, with a requirement only that the ALEC's total price to originate or terminate a call not exceed the total price that would have been charged by Sprint for the same call. I recommend that the physical arrangements for the physical interconnection of the two networks allow the ALEC to designate one point of interconnection in each local calling area, and that the point of interconnection could be at either its switch, at a switch of Sprint, or at a meet point someplace between the two networks, an option which Mr. Poag apparently would not allow. Finally, I recommend that the Commission require Sprint to deliver calls originated by and/or terminated to an ALEC from other carriers that are not directly connected to the ALEC on exactly the same terms and conditions that Sprint performs that same function for independent local exchange carriers.

1. What Are the Appropriate Rate Structure, Interconnection Rates, or Other Arrangements for the Exchange of Local Traffic between ALECs and Sprint?

Q. WHAT FINANCIAL ARRANGEMENTS DOES MR. POAG PROPOSE FOR THE

EXCHANGE OF LOCAL TRAFFIC BETWEEN AN ALEC AND SPRINT?

A. Mr. Poag proposes that ALECs and Sprint compensate each other for terminating local traffic either through a flat-rated port charge arrangement or through a per minute of use charge equal to Sprint's terminating switched access charge, less the CCL and the RIC. (Poag Direct at pages 4-5)

Q. IS EITHER OF THESE AN APPROPRIATE COMPENSATION ARRANGEMENT?

A. No. When one takes into consideration the policy goals that should be served by the compensation arrangements for local traffic exchange, it is clear that the best compensation arrangement for terminating local exchange traffic is payment for the terminating function in kind, through mutual traffic exchange, rather than in cash, as advocated by Mr. Poag.

Q. WHAT POLICY GOAL SHOULD COMPENSATION ARRANGEMENTS ESTABLISHED FOR TERMINATING LOCAL TRAFFIC BETWEEN COMPETING LOCAL EXCHANGE NETWORKS BE DESIGNED TO SERVE?

A. Whatever compensation arrangements are adopted should foster the ultimate development of effective competition in local exchange markets.

Q. WHAT IS EFFECTIVE COMPETITION?

A. Effective competition exists when a firm cannot raise its prices significantly above

its costs without losing customers to other suppliers in sufficient quantity that it is forced to bring its prices back in line with costs.

Q. IS ENTRY THE SAME AS EFFECTIVE COMPETITION?

A. No. Entry is a necessary first step towards the development of effective competition, but it is not the same as effective competition. Effective competition requires that there are enough alternatives available to and adopted by a sufficient number of consumers that the choices consumers actually make in the market force all of the firms in that market to bring their prices in line with costs and keep them there.

Q. WHAT ARE THE OBSTACLES THAT MIGHT PREVENT ENTRY FROM BECOMING EFFECTIVE COMPETITION IN LOCAL EXCHANGE MARKETS IN FLORIDA?

A. Local exchange markets are characterized by significant barriers to entry based on the nature of current technology and the long period during which consumers have faced only a monopoly supplier for local exchange service. In addition, the policy determinations that need to be made could raise equal or even greater artificial barriers to entry. Some of the conditions being proposed for entry, including some that are being proposed here in Florida and around the country, could limit entry sufficiently that effective competition could never develop, if any entry ever occurred at all.

Q. WHAT DO YOU MEAN BY BARRIERS TO ENTRY?

A. Barriers to entry occur whenever a firm that is not already in the market faces conditions that would make it have to expect to earn more than the normal return on investment before it would be a wise business decision to put shareholders' funds at risk in the market. The main types of barriers to entry arise when 1) a potential entrant knows that some or all of its investments in that market, once made, cannot easily be recovered should the entry be unsuccessful; or 2) the entrant knows it will face costs upon entering that the incumbent firm does not face. In the first case, the greater the level of investments that would be unrecoverable if entry were unsuccessful, the higher the barrier to entry, in that the greater the expected return on those investments would have to be to make the entry a reasonable business risk. Similarly, the greater the costs the potential entrant would face that the incumbent does not, the higher the barrier to entry and therefore the greater the expected return on investment would have to be to make entry a reasonable business risk. Both of these types of barriers to entry exist today in local exchange markets because of the nature of the existing technology and consumers' habits. Both of these types of barriers to entry could be increased artificially by inappropriate policy choices in this docket.

Q. WHAT ARE THE NATURAL BARRIERS TO ENTRY INTO LOCAL EXCHANGE MARKETS?

A. Local exchange telephone markets have several important characteristics that naturally create barriers to entry. First, entry will take very large capital outlays, many of which may well be unrecoverable if the firm fails in the market. Second, the

construction financed with those capital outlays will take quite some time to be able to reach beyond a small area. Third, consumers are totally unused to the idea of multiple firms supplying local exchange services, so very large marketing costs can be anticipated. Marketing costs are costs that are unrecoverable if the firm is unsuccessful and has to exit the market. Fourth, firms in telecommunications markets, unlike almost any other markets, cannot operate completely independently of each other, affected only by the interaction of what each offers to the public and how the public responds to those offerings. Instead, all firms in the market must interconnect and agree to terminate traffic for each other. There are also several other areas in which cooperation is required for competition to be possible.

The first three facts cited above by themselves mean that there are barriers to entry into local exchange markets that are greater than in many other markets. The capital and marketing outlays that are unrecoverable if the firm must exit are barriers to entry caused by the fact that these costs would be sunk once incurred. Thus, before a firm actually enters a market, it must believe that the expected revenues from entry are greater than would be the case if there were no large sunk costs from entry.

Given just the first three characteristics of local exchange telecommunications markets, most entrants are likely to begin small and grow slowly. Entrants must be able to take advantage of any synergies they have with other services they may provide, in order to start earning revenues as soon as possible to justify the very large capital outlays needed to expand their networks. In this process, entrants will be eager to serve any and all customers that they can serve for more than the marginal costs of adding the customer. Once a firm has installed network facilities, particularly outside plant, any customer that pays more than the marginal cost of

adding it to the entrant's network will help to pay for the initial investment in that network.

The entrants also need to be able to concentrate their marketing efforts where they can get the most exposure for the amount spent, in order to overcome the entrenched position of the former monopoly firm. This again is best done where the entrants can take advantage of any synergies they have with other services they provide.

Q. WHAT ARE THE SPECIFIC PRINCIPLES THAT SHOULD GOVERN COMPENSATION ARRANGEMENTS FOR TERMINATING LOCAL TRAFFIC IN ORDER TO PREVENT THOSE ARRANGEMENTS FROM RAISING ARTIFICIAL BARRIERS TO ENTRY IN LOCAL EXCHANGE MARKETS IN FLORIDA?

A. There are at least three principles that should govern compensation arrangements for terminating local traffic. First, competing local exchange carriers must be treated as co-carriers, not customers, in recognition of the fact that the need for interconnection becomes mutual as soon as an entrant signs up its first customer. Once an entrant gains that first customer, each has a mutual need for services from the other if each is to offer its customers the ability to reach all other telephone subscribers in the local exchange. Thus, compensation arrangements for terminating local exchange traffic must be reciprocal. If the compensation arrangements are not reciprocal, the firm that must pay more faces a barrier to entry. This is different from the situation with interexchange carriers, who are customers of the incumbent local exchange carriers.

Second, it is very important that the compensation arrangements for

terminating local exchange traffic foster efficiency rather than inefficiency. The fact that each carrier will need the other should not be used as a reason to create an upward spiral in either local exchange costs or rates, or to try to impose anticompetitive terms and conditions on entrants by incumbents. Firms that are just as efficient as incumbent firms should not be discouraged from entering the market because of the type of compensation arrangements for terminating local exchange traffic that are adopted.

Third, the compensation arrangements for terminating local traffic should not force entrants to select one technology over another or one network architecture over another. One of the major benefits from opening local exchange markets to entry and the development of effective local exchange competition is that the residents of the state can benefit from competition between different technologies and involving different architectures of service. If the compensation arrangements for terminating traffic skew the technology or architecture choices of entrants, however, this benefit from entry will be reduced or eliminated. This would not be in the public interest.

Q. WHAT DO YOU MEAN BY ARCHITECTURE IN YOUR LAST ANSWER?

A. By architecture, I mean such elements of service as the decision about how many switches to place and where to place them in terms of the overall networks of the entrants. The decisions made about these issues by the incumbent local exchange carriers have been influenced by a large number of factors, including their own historical practices. The current relationship of total customers to numbers of switches may no longer be efficient. Entrants should not be forced by the arrangements for terminating local exchange traffic to duplicate the choices made by

the incumbents.

Q. YOU CALL FOR EQUALLY EFFICIENT FIRMS TO BE ABLE TO ENTER THE MARKET. ISN'T THE WHOLE PURPOSE OF ALLOWING COMPETITION TO HAVE MORE EFFICIENT FIRMS ENTER THE MARKET?

A. Not entirely. Competitive entry benefits consumers when equally efficient firms enter, because they force the incumbent to reflect fully its efficiency in prices and to become more efficient than it currently is. Currently, whatever is the efficiency level of the incumbent measured in terms of its total service long run incremental costs, the prices it is charging are far higher. Entry, if the market is properly structured, can drive those prices down. If, however, the requirement is that the firm must be more efficient than the incumbent, there are fewer and fewer firms that can even enter.

Q. YOU PREVIOUSLY SAID THAT COMPENSATION ARRANGEMENTS MUST BE RECIPROCAL. WHAT DO YOU MEAN BY RECIPROCITY?

A. By reciprocity, I mean that the entrant can charge the same exact price as the incumbent charges for performing the same task, namely terminating a local call.

Q. WHY WOULD A LACK OF RECIPROCITY CREATE A BARRIER TO ENTRY?

A. A lack of reciprocity, with the entrant receiving less than the incumbent, creates a barrier to entry because it prevents a potential entrant that is just as efficient as the

incumbent from receiving the same payments as the incumbent. In this respect, it is similar to a price squeeze.

To be able to sign up any customers at all, an entrant must price below the incumbent or offer a better service for the same price. Certainly, an entrant cannot offer the same service for a higher price. If the incumbent is allowed to charge a higher interconnection price than the entrant, the entrant must be more efficient than the incumbent in order to be able even to meet the price of the incumbent, let alone price below the incumbent's price.

Suppose that the incumbent is allowed to set the rate for terminating traffic for the entrant at the incumbent's cost plus 1¢, but the entrant is only allowed to charge the cost to it of termination. Assume further that traffic is in balance, and that every call originated by a customer of the entrant terminates on the incumbent's network. If the entrant is just as efficient as the incumbent, all of its costs are the same -- except for the cost of termination. Here, because of the lack of reciprocity, the entrant faces a cost 1¢ higher than the cost to the incumbent. For the entrant to be able to even charge the same price for a local call that the incumbent charges, it must be able to provide local calls at a cost to it, before taking into account interconnection charges, of 1¢ less than providing a local call costs the incumbent. The entrant, however, is just as efficient as the incumbent. This means that providing local calls costs it the same as it costs the incumbent. As a result, because its costs of termination have been made 1¢ higher than the cost to the incumbent, the entrant cannot enter and even match the price of the incumbent. The result is it is prevented from entering.

If instead of all calls terminating on the opposite network, only some do, the amount by which the entrant must be more efficient is somewhat less, but the effect

does not go away. The effect of not requiring reciprocity in interconnection rates is to create a barrier to entry.

Q. WHAT COMPENSATION ARRANGEMENT FOR TERMINATING LOCAL EXCHANGE TRAFFIC BEST SERVES THE THREE GOALS YOU OUTLINED ABOVE?

A. The best compensation arrangement for terminating local exchange traffic that passes between the networks of two competing local exchange providers is payment for the terminating function in kind, through mutual traffic exchange, rather than in cash.

Q. WHY DO YOU RECOMMEND THE USE OF PAYMENT IN KIND, THROUGH THE USE OF MUTUAL TRAFFIC EXCHANGE, RATHER THAN PAYMENT IN CASH?

A. There are at least five reasons why I recommend the use of payment in kind, or mutual traffic exchange, rather than payment in cash. First, mutual traffic exchange is obviously reciprocal, thus respecting that all participants are co-carriers. Second, mutual traffic exchange is by far the least cost means of compensating for terminating traffic, and therefore is the method most likely to help drive local exchange rates as low as possible. Third, mutual traffic exchange offers the least ability for Sprint to use the compensation mechanism to try to impose both unnecessary and anticompetitive costs upon the entrants, thereby making it the method least likely to result in new unnecessary barriers to entry. Fourth, mutual traffic exchange is neutral in terms of both the technology and architecture that entrants might choose

to adopt. In this regard, therefore, it is the method most likely to enhance dynamic efficiency in telecommunications. Fifth, mutual traffic exchange is the only compensation mechanism that may create some incentive for Sprint to want to cooperate in developing true number portability, rather than helping Sprint to benefit further from its absence.

Q. MUTUAL TRAFFIC EXCHANGE IS OBVIOUSLY RECIPROCAL. WHY DO YOU SAY IT IS THE MOST EFFICIENT MEANS OF COMPENSATING FOR TERMINATING LOCAL EXCHANGE TRAFFIC?

A. Mutual traffic exchange is the most efficient means of compensating for the termination of local exchange traffic, for at least two reasons. First, because the termination of traffic will be paid for "in kind" by each carrier, rather than with money, each carrier has the incentive to minimize the cost of those terminations, an incentive it does not have under any other form of compensation. Second, mutual traffic exchange does not impose costs on the system that could only be justified at most for a transition period.

It is very instructive to note that mutual traffic exchange is the dominant practice that has long been in use between non-competing adjacent local exchange carriers around the country -- and in Florida -- for terminating local (Extended Area Service) traffic between adjacent territories. Where there is no gain from anticompetitive or inefficient behavior, carriers seek the most efficient approach. The dominance of mutual traffic exchange in these relationships suggests strongly the efficiency of this approach.

Q. WHY DOES MUTUAL TRAFFIC EXCHANGE CREATE THE BEST INCENTIVES AVAILABLE TO MINIMIZE THE COST OF TERMINATING TRAFFIC?

A. Because of the inherent nature of payments in kind, rather than in cash, the payer actually has the ability to affect the cost to itself of the "in kind" payment. This means that each carrier will try to terminate traffic at least cost, thus promoting efficiency. The result will be to seek out more efficient ways to terminate traffic, and, if effective competition can develop, these cost savings will be passed on in reduced local exchange service rates. The likelihood of reduced local exchange service rates is enhanced under mutual traffic exchange relative to almost all other forms of compensation because termination in kind means that the cost for termination is no higher than its total service long run incremental cost, rather than also including some "contribution."

If termination of traffic is paid for with money, as is proposed by Sprint, one effect is to give the incumbent the incentive to make the cost inefficiently high and pass that inflated cost on to its competitors. If termination of traffic is paid for in kind, however, any such cost-raising activities fall on the traffic terminator, not the traffic originator. Thus, if the incumbents tried to terminate traffic in an inefficient manner, the costs would fall on them, not the entrants. The result is to encourage the incumbents to terminate traffic in the most efficient manner possible.

Q. WHY DOES MUTUAL TRAFFIC EXCHANGE NOT IMPOSE COSTS THAT ARE JUSTIFIED AT MOST ONLY FOR A TRANSITION PERIOD?

A. Once all the conditions for effective competition have been established, it is virtually certain that the amount of compensation that would be due to one network would be exactly offset by the amount due to the other. Unless there are significant distortions between networks, the traffic between networks tends to be in balance over time. This means that it is inefficient for firms to develop measurement and billing arrangements that can significantly increase the costs of doing business when the amounts to be paid are going to cancel out over relatively short periods of time. Mr. Poag states that the recording of usage for purposes of applying a per minute of use charge requires special software which Sprint has not deployed in its switches. In fact, Mr. Poag states that because of the high cost of the software, Sprint does not currently plan to deploy the software in any switches other than its access tandems. (Poag Direct at pages 17-18) Based on information that I have seen in other states, developing such a measurement and billing system could more than double the total service long run incremental cost of the switching function for terminating traffic from the cost without measurement and billing. This is a significant -- and totally unnecessary -- cost burden to add to local exchange service, when it can only be justified at best for a relatively brief period of time. It also imposes other costs on local exchange service, costs that fall more heavily on the entrants than on Sprint. Mutual traffic exchange is much more efficient, as it prevents the addition of these costs and reflects the likely outcome in a world where all of the necessary conditions have been met for effective competition, particularly true number portability.

Q. WHY DO YOU SAY THAT MUTUAL TRAFFIC EXCHANGE OFFERS THE LEAST ABILITY FOR SPRINT TO USE THE COMPENSATION MECHANISM TO TRY TO IMPOSE UNNECESSARY BARRIERS TO ENTRY?

A. Under mutual traffic exchange, Sprint cannot impose costs on its rivals through how it provides or bills for compensation. Under Sprint's proposal, however, it has no incentive to ensure that the "high cost" measurement method being deployed is not unnecessarily costly, since it will pass that cost along to its rivals.

Moreover, based on the experiences to date with the billing for carrier access charges, the fact of billing will pose additional unnecessary costs in the form of auditing and verification costs. Carrier access bills have been sufficiently in error that it has been cost effective for interexchange carriers to hire people full time to audit and try to get corrections made in these bills. These auditing costs have not been one-time costs, but continue to be incurred today. The costs to the interexchange carriers are less than the savings from what they otherwise would have been required to pay, but these expenditures bring with them no social benefits whatsoever. In other words, these costs are a total dead weight loss to society.

Local exchange users will gain no benefits from duplicating this experience in the local exchange arena. Doing so, moreover, would deny consumers the ability to have local exchange rates fall as far as they might otherwise fall. These auditing costs would become another irreducible part of the cost floor for local exchange service. Because the rates for basic local exchange service are central to the provision of universal service, it would be bad public policy to insist on arrangements that raise costs, rather than lowering them.

Q. EARLIER, IN LISTING THE ADVANTAGES OF MUTUAL TRAFFIC EXCHANGE, YOU SAID THAT MUTUAL TRAFFIC EXCHANGE IS NEUTRAL IN TERMS OF BOTH TECHNOLOGY AND ARCHITECTURE. WHY?

A. Mutual traffic exchange is totally neutral in terms of both technology and network architecture because the amount paid to each participant does not depend upon the choices of technology or architecture. Each carrier can select the technology and network architecture that it wants, without having to factor in possible penalties that could arise under other arrangements for terminating local traffic. This is very important for the dynamic efficiency of telecommunications. The greatest benefits to consumers from entry over time will come from the efficient search for and deployment of new and better technologies for sending and receiving information.

Q. WHY MAY MUTUAL TRAFFIC EXCHANGE CREATE AT LEAST SOME INCENTIVE FOR THE INCUMBENT LOCAL EXCHANGE CARRIERS TO COOPERATE IN THE DEVELOPMENT OF TRUE NUMBER PORTABILITY?

A. Mutual traffic exchange is the only arrangement that has been discussed that may create some incentives -- even if slight -- for the incumbent carriers to cooperate in the development of true number portability, because the lack of true number portability may make the costs to the incumbents higher than if true number portability were present. To the extent that traffic might not be in balance at the outset, it is likely to be because a significant number of customers do not want to change their telephone numbers. Some customers, particularly business customers who are more likely to have more than one line, might respond by splitting their subscriptions, retaining some lines from the incumbent and along with them their old telephone numbers, while using the entrant for outgoing traffic. Under mutual traffic exchange, this would make the incumbent's terminating costs higher than if the

customer moved all of its lines to the entrant.

Creating incentives for the incumbent local exchange carriers to cooperate with the development of true number portability is important, because they benefit from the lack of true number portability. Thus, they have every incentive to try to resist its development and deployment, and to try to insist that only entrants should pay any costs to achieve it. This is not good for the public.

Q. DO YOU BELIEVE TRAFFIC WILL BE IN BALANCE?

A. Yes. Networks tend normally to have roughly equal amounts of incoming and outgoing traffic. Unless very strong incentives exist to try to select customers on the basis of their incoming or outgoing traffic patterns, the way entrants will build their networks should produce the same outcome. Entrants will put facilities in certain locations, and then try to get as many customers as possible in that general location to subscribe to service using those facilities. Once an entrant has facilities in one neighborhood, the entrant will want to serve as many customers who are there as can be induced to switch to the entrant, regardless of their particular usage patterns, because a number of the costs of the facilities do not vary with the number of customers served. This will be true, moreover, whether the entrant is using fiber or radio systems. Even radio-based systems have equipment that is geographically specific and that can be used in common by a number of subscribers, so long as they live in the relevant geographical area. An entrant, with no customers from whom it can cross subsidize its services, would be willing to serve any customer who pays more than the direct costs it imposes, unless again there is both a strong incentive and the ability to do otherwise.

Such an incentive would exist only if serving customers with one pattern of usage was made prohibitively expensive. This could occur if the rate to entrants for terminating traffic on the network of the incumbent were made higher than the rate the entrants could charge the incumbent, or if the compensation for terminating traffic on the network of the incumbent is very high relative to the price for local calling. If there were any entry at all under either of these conditions, the entrant would have a strong incentive to serve customers who had little outgoing local exchange traffic, but who had a large amount of incoming traffic. Such customers would leave the entrants paying for many fewer calls to the incumbent while receiving payment for many more calls from the incumbent.

If such an incentive were created, the entrants would also have to know the ratios of customers' incoming and outgoing traffic. This is not necessarily known or easy to know by either the customer or the entrant. Most customers do not get reports of incoming (non-800) traffic. Thus, entrants may not have the ability to make a distinction among customers based on whether they have mostly incoming or outgoing traffic.

In the absence of both an incentive and the ability to distinguish between customers based on their relative proportions of incoming and outgoing traffic, it seems much more likely that traffic will be in balance between networks. The aggregation of the traffic patterns of a number of customers would suggest this outcome.

Q. WOULDN'T THE UNEQUAL SIZES OF THE RELATIVE NETWORKS SUGGEST TRAFFIC WOULD NOT BE IN BALANCE?

A. No. The relative size of networks does not determine how much traffic will flow in each direction. The easiest way to see that this is the case is to imagine a small carrier with only a few customers, but those customers spend their entire waking hours calling customers of the big network. Because of the number of customers of the small network, if all of them were to do nothing but call customers of the big network, they still would not generate a large number of calls. Meanwhile, it only takes a few calls each from customers of the big network calling customers of the small network to equal the number of calls that could go from the customers of the small network to the customers of the big network.

For example, if a new entrant were to gain a 2 percent market share in Fort Myers, then on average its customers would be likely to make 2 percent of their local Fort Myers calls to other customers of the new entrant, and 98 percent of their local Fort Myers calls to customers of Sprint. At the same time, on average Sprint's customers would make 98 percent of their local Fort Myers calls to other Sprint customers and 2 percent of their local Fort Myers calls to customers of the new entrant. But 98 percent of the calls originating on the network of a provider with 2 percent of the market is the same number of calls as 2 percent of the calls originating on the network of a provider with 98 percent of the market, leaving the total number of calls terminated by each provider on the other provider's network in balance.

Q. YOU RECOMMEND THE USE OF MUTUAL TRAFFIC EXCHANGE TO COMPENSATE FOR TERMINATING TRAFFIC ORIGINATED ON ANOTHER LOCAL EXCHANGE NETWORK. IS MUTUAL TRAFFIC EXCHANGE REQUIRING SPRINT TO TERMINATE ITS RIVALS' LOCAL EXCHANGE TRAFFIC "FOR FREE?"

A. No. It is important to remember that rival local exchange carriers are not customers, but co-carriers. That means, whenever the rival has acquired a single customer, traffic will flow both ways. Mutual traffic exchange simply involves each carrier "paying" for the other to terminate local calls originated by its subscribers by mutually terminating local calls originated by the customers of the other carrier. That is why I referred to it as payment "in kind" rather than "in cash."

Q. DOES SPRINT AGREE THAT INTERCONNECTION COMPENSATION SHOULD BE BASED ON MUTUAL TRAFFIC EXCHANGE?

A. No. Sprint has proposed to charge local exchange entrants either a flat-rated port charge or switched access charges other than the Carrier Common Line Charge and the Residual Interconnection Charge. The use of any part of switched access charges is inappropriate.

Q. WHY WOULD SWITCHED ACCESS CHARGES BE INAPPROPRIATE FOR COMPENSATION FOR TERMINATING LOCAL EXCHANGE TRAFFIC?

A. The use of switched access charges for compensation for terminating local exchange traffic would totally bar entry, because the current regulation of Sprint would prevent it from imputing these rates into its own local exchange rates. If Sprint were able to reset its local exchange rates in order to pass an imputation test, it would make entry at least possible, although it would create a significant and unnecessary upward spiral in local exchange rates. In short, use of switched access charges for

compensation for terminating local exchange traffic under Sprint's current regulatory restrictions would deny the public all of the benefits that could come from local exchange competition. Use of switched access charges for compensation for terminating local exchange traffic if Sprint's current regulatory restrictions were relaxed to allow imputation would deny the public one of the two major potential benefits from competition, namely reduced costs and prices.

Even if it were willing to pay the entrant's switched access charges, however, if it also insists that the entrant must mirror the switched access rate structure of Sprint, reciprocity in that part of the interconnection charge could occur only if the entrant mirrored the architecture, at least, of the incumbent, rather than picking the architecture that would otherwise be efficient, as discussed below. This would deny the public the other major potential benefit from entry, namely the promotion of more rapid deployment of new and better technologies.

Q. IN YOUR INITIAL DISCUSSION OF THE PRINCIPLES THAT SHOULD BE SERVED BY THE METHOD OF COMPENSATING FOR TERMINATING LOCAL EXCHANGE TRAFFIC BETWEEN COMPETING LOCAL EXCHANGE CARRIERS, YOU NOTED THAT IT WAS IMPORTANT THAT THE METHOD OF COMPENSATION NOT BE USED TO CREATE AN UPWARD SPIRAL OF LOCAL EXCHANGE COSTS OR RATES. YOU ALSO SAID THE USE OF SWITCHED ACCESS CHARGES FOR COMPENSATION WOULD EITHER BAR ENTRY OR CREATE SUCH AN UPWARD SPIRAL, ASSUMING A CHANGE IN HOW SPRINT IS REGULATED. HOW?

A. The use of switched access rates create an intolerable price squeeze. The only way

for the Commission to allow these rates to go into effect and not kill any possibility whatsoever for competition would be to require Sprint to impute the same rates into all of its local exchange rates. Imputing switched access rates into local exchange rates, however, would mean raising basic local exchange rates for reasons other than an increase in the economic cost of providing local exchange service.

A far better approach would be to adopt mutual traffic exchange. Mutual traffic exchange does not create a conflict between Sprint's current regulation and the possibility of gaining any benefits of entry. This is in addition to all of the other benefits I have listed above that arise from the use of mutual traffic exchange.

Q. WHAT DO YOU MEAN BY A PRICE SQUEEZE?

A. By the term "price squeeze" I am referring to a particular relationship between two prices (or two sets of prices). This relationship can arise whenever a monopoly supplier of inputs to other firms also competes to sell the end user service. If that monopoly supplier sets the price or prices of the bottleneck monopoly inputs at a level such that its end user price does not recover both the price(s) for the monopoly input(s) and the rest of the costs of producing the end user service(s), a price squeeze exists. Under a price squeeze, a dependent competitor that is just as efficient as the monopolist cannot cover all of its costs at the price for the end user product charged by the monopolist. There is absolutely no way that an unregulated, competitive firm can lose a penny on every sale and make it up in volume. Thus, when a firm sees that it is going to be subject to a price squeeze, what it sees is a barrier to entry.

Q. IF SWITCHED ACCESS CHARGES ARE USED FOR COMPENSATION, WHY

WOULD RECIPROCITY ONLY BE POSSIBLE, IF AT ALL, IF THE ENTRANT MIRRORED THE ARCHITECTURE OF THE INCUMBENT?

A. Switched access charges are composed of a series of rate elements charged for the use of different piece parts of the incumbent's network to terminate a call. Except for the rate elements designed to pay "contribution," if the piece part is not used, then the rate element is not charged. The proposals to use switched access charges for compensation mostly include the same requirement. Thus, the entrant would only be allowed to charge for the same categories of costs that the incumbent claims are the costs of providing service.

Suppose an entrant placed only a single switch, using much more "loop" plant than the incumbent. The total cost to it to terminate a local call for the incumbent may or may not be less than the incumbent's costs, but those costs may be in different categories from those used by the incumbent. If the only costs the entrant can recover in its local interconnection tariff are switching and transport costs, however, it will be handicapped relative to the incumbent, and may be prevented from recovering all of its costs regardless of whether they are less than or equal to the incumbent's costs. Particularly in the early years of its existence, an entrant will mostly be terminating calls from customers of the incumbent rather than from its own customers. Because of the inability to recover its costs using its preferred architecture, it will face an incentive to try to mirror the architecture of the incumbent, even if it were not the most efficient architecture. This would be very bad for the public, because it would reduce the dynamic efficiency benefits from entry.

Q. WOULD A COMPENSATION PROPOSAL SIMILAR IN STRUCTURE TO SWITCHED ACCESS CHARGES BUT WITH THE ACTUAL RATES SET JUST AT COST BE THE SAME AS MUTUAL TRAFFIC EXCHANGE IN TERMS OF ITS BENEFITS?

A. No. Although setting the rates at cost instead of above cost would clearly be preferable, such a compensation arrangement still would lead to significantly higher costs for local exchange service than a system of mutual traffic exchange, for the reasons discussed above. It would also still create uneconomic incentives for the entrants to adopt an architecture or technology that is less efficient, solely in order not to be penalized by the compensation mechanism, as discussed above.

Q. IN ADDITION TO DETERRING ENTRY, ARE THERE ANY OTHER PROBLEMS CREATED IF COMPENSATION IS NOT RECIPROCAL?

A. Yes. There is a second problem caused if compensation is not reciprocal, and that is that even if a more efficient firm enters the market, that firm is required to transfer its efficiencies to the incumbent, rather than being able to use its greater efficiency to gain market share. This also reduces the likelihood of a potential entrant actually entering the market.

This problem can be seen by an example. Suppose there are two firms in the market, and each terminates on the other network half of the local calls that originate on its network. Suppose it costs the incumbent 3¢ per call to terminate local calls, but it only costs the entrant 2¢. Suppose further that it also costs the incumbent 3¢ per call for origination, but it only costs the entrant 2¢ per call. If the entrant has

to charge the incumbent only 2¢ per call terminating into the entrant's network, the incumbent could offer its own customers calling at 5 and 1/2¢ per call, which is less than the 6¢ per call that it currently costs the incumbent to originate and terminate using only its own network. The entrant, meanwhile, will have to charge 4 and 1/2¢ per call in order to recover the interconnection charges that it has to pay the incumbent. If, however, the entrant were allowed to charge the incumbent 3¢ per call for termination, equal to the charge of the incumbent, it could charge 4¢ per call to its own customers, passing on to them the full benefits of its greater efficiency. The incumbent would have to charge the full 6¢ per call until it became as efficient as the entrant. In this example, the market would send the right information to consumers about which firm is more efficient, and the right signals to the incumbent to become more efficient.

Q. MR. POAG STATES THAT HE DOES NOT BELIEVE THAT "BILL AND KEEP" NECESSARILY MEETS THE STATUTORY REQUIREMENT THAT THE INTERCONNECTION CHARGE COVER ITS COSTS. (POAG DIRECT AT PAGE 3) IN YOUR OPINION, DOES MUTUAL TRAFFIC EXCHANGE MEET THIS STATUTORY REQUIREMENT?

A. Yes. The price ultimately charged by Sprint for local interconnection will set the appropriate market price that Sprint would be required to pay for terminating traffic on the network of a new entrant. If traffic is in balance, as would be expected once there is a true database solution to local service-provider number portability, then under Mutual Traffic Exchange, Sprint will receive a service for which it would have had to pay that same amount of money.

Q. IF THE COMMISSION BELIEVES THAT COMPENSATION SHOULD BE IN CASH, RATHER THAN IN KIND, WHAT RATE LEVEL WOULD BE APPROPRIATE FOR COMPENSATION FOR TERMINATING LOCAL CALLS?

A. The rate should be set at the direct economic costs of supplying the termination by the incumbent, and no higher. Only if this is the rule for the rates for compensation for terminating local calls can the price for local exchange services have any chance of falling to the social cost of providing them.

Q. YOU USED THE TERM "SOCIAL COST" IN YOUR LAST ANSWER. WHAT IS SOCIAL COST AND HOW DOES IT RELATE TO ECONOMIC COSTS?

A. The social cost of providing a good or service is equal to the cost of the resources that society must give up to produce that good or service. The economic cost of providing a good or service is equal to the least cost firms in the given market would face when operating efficiently. Both concepts of cost include a competitive level of profit, but not any higher level of profit. If all goods and services are sold at their social cost, then the economic costs of services will be equal to their social costs.

If, however, some intermediate goods or services -- that is, goods or services used as inputs in the production of other goods or services -- are priced above their social costs, the economic costs of the goods or services that use them will be higher than their social costs. This is in fact the case today for interexchange services. Because switched access is priced far above its social cost, the economic cost of interexchange services is also far above the social cost of interexchange services. The

same thing could happen to local exchange services if the rates for interconnection and other essential monopoly input functions needed to supply local exchange services are allowed to be set in excess of their social cost.

Q. WHY WOULD RATES FOR COMPENSATING FOR TERMINATING LOCAL EXCHANGE TRAFFIC HIGHER THAN THE DIRECT COST OF THE TERMINATIONS RESULT IN PRICES FOR RETAIL SERVICES BEING UNABLE TO FALL TO THE SOCIAL COSTS OF SUPPLYING THEM?

A. If the Commission wants effective competition to be able to drive retail service prices down to the social cost of providing them, it needs to set interconnection service prices at the direct cost of supplying them, and look only to retail services for collection of all of the costs of the incumbent local exchange carriers other than the direct cost of providing interconnection services. Telecommunications is unlike almost any other market in the fact that carriers cannot be in business without interconnecting to competitors. Carriers, however, do not go into business for the purpose of supplying interconnection, but for the purpose of serving end users. Therefore, carriers should look to end users for the recovery of all of the indirect costs of the firm.

It is very important to understand that whatever prices are set for interconnection services become part of the economic costs of the companies that must pay them. Connecting carriers cannot compete down the prices for interconnection services, and will be denied service if they do not pay the asking price. Thus, these prices are real costs to the connecting carriers, and are part of the economic costs of providing retail services, even if those prices are above the social

costs to provide interconnection services. If interconnection service prices are any higher than the direct cost of supplying them, effective competition may develop in terms of driving prices down to the economic costs of supplying retail services, but those costs will be higher than the social costs of supplying those retail services.

If there is to be any competition at all for the retail services that the incumbent local exchange companies provide at the same time that they provide these necessary interconnection services for their rivals, the prices the incumbents charge their rivals for the interconnection services must be part of the retail price floor facing the incumbent carriers as well. Otherwise, the incumbent local exchange carriers can charge their rivals more for interconnection services than they recover for those same services, which would allow the incumbents to underprice equally efficient rivals in the retail market. This is anticompetitive, and prevents the development of competition for the retail services affected. Thus, if any competition is to be possible, the incumbent local exchange carriers must recover at least the same prices for interconnection services as they charge their rivals. As a result, whatever those prices are become part of the economic costs of the retail services.

The interconnecting carriers do not only have costs for interconnection. They also have direct costs for other inputs into their retail services. Further, they also have indirect costs that they must recover through markups over direct cost in their retail service rates. These are costs of doing business that do not vary with the output of the retail service, such as overhead costs. If the interconnection rates that the interconnecting carriers must pay include some of the recovery of the indirect costs of the incumbent local exchange carriers, two bad effects occur. First, the basic level of prices in the retail market is higher than it would be otherwise, as new entrants will have to price to recover their own indirect costs, and to help recover the

indirect costs of the incumbent. Second, the amount of recovery of the incumbent's indirect costs in interconnection rates will be shielded completely from competitive pressure, since those indirect costs will be imposed on the competitors, and cannot be competed out.

If interconnection prices are set at cost, but no higher, all firms will have to look to their retail customers for recovery of all of their indirect costs, as well as for recovery of their direct costs of providing the retail services. A firm that is inefficient at supplying the functions that do not vary with the volume of service will discover that it has to set its retail prices higher than its more efficient competitors. This will cause it to lose market share, and so force it to become more efficient at performing those functions. This is to the benefit of consumers.

If, however, interconnection prices include a markup over cost, this same market pressure cannot develop for the amount of the markup contained in interconnection rates. Basically, it is very important to remember that interconnection rates cannot be competed down. Under those circumstances, the costs recovered in those prices cannot face a market test for efficiency.

If the Commission wants competition to bring retail prices down to the social cost of providing them (or as close to that level as is possible), it will have to set the prices for the necessary interconnection services to recover just the economic cost of providing them and no more. This means pricing these services to recover the total service long run incremental cost (TSLRIC) of supplying them, but not including any markup over that cost level in interconnection prices.

Q. DOES MR. POAG'S PROPOSAL TO OFFER LOCAL INTERCONNECTION AT SWITCHED ACCESS RATES, EXCLUDING THE CCL AND THE RIC, RESULT

IN A PRICE THAT IS ABOVE THE TSLRIC COST OF PROVIDING THE INTERCONNECTION?

A. Although I have not reviewed Sprint's cost data, the price for switched access almost certainly includes a contribution above direct economic costs. In the recent hearing involving BellSouth's local interconnection arrangements, for example, BellSouth's switched access charge, excluding the CCL and RIC, was 1.052 cents per minute, while the cost of those functions was much less, and could be expressed in tenths of a cent per minute.

Q. IS MR. POAG'S PROPOSAL FOR A FLAT-RATED INTERCONNECTION CHARGE ON A PER PORT BASIS AN APPROPRIATE ALTERNATIVE TO MUTUAL TRAFFIC EXCHANGE?

A. No. Mr. Poag makes clear that the per port charge is above cost. Moreover, it suffers from the same defects as a charge per minute of use in that it imposes unnecessary transactions costs of billing, auditing, and the like. Even if these defects were cured, it still should not be offered as the exclusive option.

Q. MR. POAG'S DISCUSSION OF SPRINT'S FLAT-RATED PORT PROPOSAL MAKES CLEAR THAT SPRINT PROPOSES TO CHARGE MORE FOR TANDEM INTERCONNECTION THAN FOR END OFFICE INTERCONNECTION, BUT THAT IT INTENDS TO COMPENSATE ENTRANTS ONLY FOR END OFFICE INTERCONNECTION. IS THIS APPROPRIATE?

A. No. Mr. Poag's discussion of the tandem functions at page 16, line 14, to page 17, line 6, makes clear that the tandem is an essential facility that can only be provided by Sprint. Sprint will not rehome all of its central offices on a switch provided by an entrant for all functions served by a tandem, and there are large economies of scope in the tandem function. Given these two facts, only Sprint can provide the tandem function. Requiring entrants to pay more for tandem interconnections than for end office interconnections is simply an abuse of Sprint's monopoly over tandem functions. Entrants cannot duplicate this function, and so cannot avoid paying more for interconnections than does Sprint.

Q. MR. POAG CLAIMS THE DIFFERENTIAL IS NECESSARY TO REFLECT DIFFERENCES IN COST, AND THAT ENTRANTS CAN BUILD TO EACH END OFFICE TO AVOID THE EXTRA TANDEM CHARGES. DO YOU AGREE?

A. This would only be the case for entrants that wanted to use Mr. Poag's flat-rate ports, not the per minute of use charge. Sprint is only going to install the special, high-cost software in the access tandem, apparently forcing all entrants to choose between using only tandem interconnections and being able to pay a charge per minute of use, or having to pay for a port to avoid paying for tandem functions. Sprint should not be allowed to force these choices on entrants. Instead, if the Commission rejects the best solution of Mutual Traffic Exchange, it should require the rate paid, whether per port or per minute, to be the same whether the interconnection is at the tandem or the end office, and that it be reciprocal.

Q. ON PAGE 16, LINES 16-22, MR. POAG DEFENDS SPRINT'S PROPOSAL TO CHARGE MORE FOR INTERCONNECTION USING A TANDEM BY CLAIMING THAT THE COSTS TO SPRINT OF USING A TANDEM "OFFSET" THE CHARGES TO ENTRANTS. IS HE CORRECT?

A. No. First of all, not all of Sprint's local traffic uses a tandem. Second, the charge to entrants is higher than Sprint's cost, which is all that Sprint incurs for its own traffic.

2. What Are the Appropriate Rate Structure, Interconnection Rates, or Other Arrangements for the Exchange of Toll Traffic Between ALEC and Sprint?

Q. DO YOU AGREE WITH MR. POAG THAT SPRINT AND THE ALECS SHOULD COMPENSATE EACH OTHER FOR JOINTLY PROVIDED INTRALATA TOLL THROUGH THE PAYMENT OF SWITCHED ACCESS CHARGES? (POAG DIRECT AT PAGE 23)

A. Yes. Toll traffic should be exchanged using each carrier's switched access charges. Sprint already has an access charge tariff. Each ALEC should be allowed to file an access charge tariff of its own, with the only requirement being that the total charge for originating and terminating toll calls by the ALEC not exceed the total rate that would have been paid to Sprint.

3. How Should Competing Local Exchange Networks be Physically Interconnected?

Q. HOW DOES MR. POAG PROPOSE THAT COMPETING LOCAL EXCHANGE NETWORKS BE PHYSICALLY INTERCONNECTED?

A. Mr. Poag's testimony is not entirely clear on this point, although it appears that he proposes to have interconnection take place only at Sprint's access tandems or end offices. (See Poag Direct at pages 3, 7, 17) Sprint does not appear to contemplate that it would interconnect to an ALEC's network via a "meet point" arrangement.

Q. HOW SHOULD THE NETWORKS OF ENTRANTS AND OF INCUMBENTS BE INTERCONNECTED PHYSICALLY?

A. The major requirement for physical interconnection is that it should be done in the most efficient manner possible. This means that interconnection should be allowed at any feasible point of interconnection, rather than being arbitrarily limited to only certain points, and that the facilities -- trunks -- that actually join the two networks also be as efficient as possible. Additionally, signaling networks need to be interconnected and need to pass sufficient signaling information so that all of the services possible with today's technology can be offered to all customers.

Q. WHAT DO YOU MEAN BY ALLOWING INTERCONNECTION AT ANY FEASIBLE POINT OF INTERCONNECTION?

A. Based on the arrangements already in use today, interconnection clearly can occur at a number of points. Interexchange carriers interconnect with local exchange carriers either at their own Points of Presence, or, thanks to recent Federal regulatory changes, at the switch of a local exchange provider. The incumbent local exchange providers often interconnect with each other at a "meet point," which is just a division of ownership of a trunk connecting two switches owned by different companies. The "meet point" is usually the boundary between two adjacent exchanges.

All of these are feasible points of interconnection between Sprint and competitive local exchange entrants. The point of interconnection for a trunk connecting the networks could be at either end -- at the switch of either the entrant or Sprint -- or it could be in the middle, defining a "meet point" between the two networks. The entrant should get to select which of these it wishes, as its choice will be dictated solely by the desire to minimize costs. That choice should allow the entrant to select only one point of interconnection per local calling area.

Q. WHY WOULD THE ENTRANT, BUT NOT SPRINT, WANT TO MINIMIZE COSTS?

A. In order to attract customers, an entrant must offer either lower prices or improved services over what customers can get from Sprint. In order to do either of these, the entrant needs to keep its costs as low as possible. Moreover, an entrant will be likely initially to have a higher percentage of its traffic going to Sprint's network than the percentage of its total local traffic Sprint has that will terminate on the network of the entrant, although the actual quantities should be in balance. Thus, interconnection

costs will be a higher percentage of its costs of providing local calling. This increases the incentive of the entrant to keep those costs as low as possible.

Sprint, on the other hand, can use interconnection costs as one of a number of opportunities to try to handicap the entrant, by making the entrant's costs higher than Sprint's, thus blocking or impeding entry. One way to do this is to insist upon unnecessarily costly methods of interconnection. Thus, allowing the entrant to select which of the points of interconnection it wants to use is the method most likely to minimize these costs.

Q. SHOULD SPRINT BE ALLOWED TO REQUIRE COLOCATION IF THE ENTRANT WANTS TO PROVIDE SOME OF THE TRUNKS USED FOR INTERCONNECTION?

A. No. The Commission should require Sprint to allow entrants to specify a "meet point" as an additional option. Only if the entrant is allowed to specify that it wants a meet point can it have the actual trunks that provide interconnection supplied only at direct economic cost. If it has this right, it may be able to negotiate with Sprint for other configurations that also result in the payment only of direct economic cost. If it does not have this right, it has no bargaining power, and Sprint can force it to pay more for interconnections than Sprint pays, adding to the anticompetitive nature of the proposed interconnection arrangements.

Q. WHAT DO YOU MEAN BY THE USE OF THE MOST EFFICIENT TRUNKS?

A. Trunks can be either one-way trunks or two-way trunks. The former carry traffic in

only one direction, the latter in both. Often, two-way trunks are more efficient, as they allow more traffic to be carried on a given number of circuits. Each entrant should be allowed to select the form of trunking that is most efficient for it, including being able to put both local exchange and intraLATA traffic on the same trunks, in order to minimize costs.

4. What Are the Appropriate Arrangements for the Delivery of Calls Originated by and/or Terminated to ALEC an From Other Carriers That Are Not Directly Connected to the ALEC?

Q. HOW DOES MR. POAG PROPOSE THAT SPRINT BE COMPENSATED FOR THE DELIVERY OF CALLS ORIGINATED BY AND/OR TERMINATED TO AN ALEC FROM OTHER CARRIERS THAT ARE NOT DIRECTLY CONNECTED TO THE ALEC?

A. Mr. Poag proposes that Sprint be compensated for the tandem switching function and the transport function, presumably at the switched access charge rates applicable to those functions, and also be allowed to pass-through any terminating local interconnection charge paid by Sprint to an ALEC who terminates the call. (Poag Direct at page 25)

Q. IS THIS AN APPROPRIATE COMPENSATION ARRANGEMENT FOR PROVIDING THE INTERMEDIARY FUNCTION FOR TRAFFIC?

A. No. Mr. Poag's proposal would be appropriate, however, if the charge for the

tandem switching and transport functions for local traffic was set equal to the direct economic costs (TSLRIC) of providing those functions, rather than set at Sprint's switched access charge rates. Further, Sprint should be required to handle toll transit traffic exactly as it does for independent local exchange carriers.

Sprint should be required to do this because it holds a monopoly over the transit function. Because of its status as the former monopoly company, all carriers are connected to Sprint. Sprint should not be allowed to refuse to serve as the transit carrier, given that this would be the most efficient way to get the traffic to its destination. Nor should it be allowed to use its position to force entrants to pay a discriminatory price for this service.

5. What is the Appropriate Rate for Unbundled Local Loops?

Q. MR. POAG STATES THAT SPRINT WILL OFFER UNBUNDLED LOCAL LOOPS AT THE PRICE SET FORTH IN SPRINT'S SPECIAL ACCESS TARIFFS. (POAG DIRECT AT PAGE 32) ASSUMING THAT THE ISSUE OF THE PRICE FOR UNBUNDLED LOCAL LOOPS IS PROPERLY BEFORE THE COMMISSION IN THIS DOCKET, IS THE PRICE PROPOSED BY MR. POAG APPROPRIATE?

A. No. The price for unbundled local loops (and loop concentration and loop transport, which are not mentioned in Mr. Poag's testimony but should be offered as part of the initial set of unbundled elements) should be set at direct economic cost (TSLRIC). Any other level of price above cost would have no ability to permit Sprint to pass an imputation test, enabling Sprint to create a price squeeze. As discussed earlier, a

price squeeze exists whenever a firm that supplies essential inputs to a competitor recovers less in its end user rates for those essential inputs than it charges its competitors. Given the flat rates charged for local exchange service, and particularly residential local exchange service, a price for loops that was greater than TSLRIC would create a price squeeze for entrants.

6. Miscellaneous Issues.

Q. MR. POAG STATES THAT SPRINT WILL ALLOW CONNECTIONS BETWEEN ALECS THROUGH ITS TARIFFED COLOCATION FACILITIES WITHOUT BEING ROUTED THROUGH THE TANDEM, BUT THAT SPRINT WILL NOT PERMIT ALECS TO DIRECTLY CONNECT TO EACH OTHER ACROSS SPRINT'S FLOOR SPACE WITHOUT GOING THROUGH SPRINT'S COLOCATION FACILITIES. (POAG DIRECT AT PAGE 35) IS THIS AN APPROPRIATE RESTRICTION?

A. The only restriction that Sprint should be permitted to impose is a requirement that ALECs desiring direct ALEC-to-ALEC interconnection be colocated at the same Sprint central office and/or tandem. Permitting Sprint to impose other restrictions would simply permit it to impose additional costs on its competitors. For a direct ALEC-to-ALEC interconnection between colocation facilities, Sprint should be permitted to charge a rate equal to its direct economic cost (which includes a return on investment) of furnishing the in-house cabling used to accomplish the connection. All other costs incurred by Sprint are already covered in its colocation charges.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BIOGRAPHY

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EXPERIENCE

10/88-Present Private consultant. Microeconomic consulting, primarily in fields of telecommunications and antitrust.

2/82 - 10/88 President: Cornell, Pelcovits & Brenner Economists Inc. Microeconomic consulting, primarily in fields of telecommunications, broadcasting, environmental, and antitrust economics. Assignments have included serving as an expert witness before State and Canadian regulatory agencies on many emerging issues in telecommunications such as: the appropriate structure of access charges to interexchange companies; the public interest benefits of competition and of resale; the need to separate the unregulated from the regulated activities of telephone companies; appropriate telephone costing methodology, market rules, and industry structure; the proper costing of Centrex service; the setting of appropriate prices for the sale of embedded terminal equipment; and the appropriate application of cost and demand studies to the design of telephone tariffs; assisting in the cross examination of opposing witnesses and preparation of information requests; sponsoring cellular tariffs in cellular applications to the FCC; and testifying before Congressional committees on the economics of home taping, copyright, and the First Sale Doctrine.

3/81 - 2/82 Vice President: Owen, Cornell, Greenhalgh & Myslinski Economists Inc. Microeconomic consulting in telecommunications, broadcasting, environmental, and antitrust economics. Assignments included serving as expert witness in court cases, including U.S. v. AT&T, and before the Public Service Commission of the State of Florida on the public interest benefits of competition in long haul services and of resale, and on standards for access charges for competitors; assisting in preparation of depositions and cross examination of opposing witnesses; preparing an analysis of the economic impact of the broadcasting regulations on the video industry; preparing a cost-benefit analysis of proposed water pollution control regulations for the steel industry and defending it before EPA.

5/78 - 2/81 Chief: Office of Plans and Policy, Federal Communications Commission. Responsible for proposing policy and directing medium and long-range planning for the Commission. During this period, developed an in-house economics capability and functioned as chief economist for the Commission, sat at all Commission meetings, and advised the Commissioners on economic policy issues and alternatives. Directed a staff of 28-35 of mixed disciplines, mainly economics and engineering. Projects of the Office covered such topics as appropriate regulation for common carriers, including involvement in developing a new cost manual, further extensions of resale to switched intercity services, appropriate instances to require separate subsidiaries, and proper regulatory treatment of non-dominant common carriers; direct broadcast satellites; public coast stations; and radio; appropriate policies to achieve an improved UHF TV service; children's television; and how to improve spectrum management.

2/77 - 5/78 Senior Staff Economist: Council of Economic Advisors. Covered all areas of regulation except energy for the Council. Some major areas of activity were development of the regulatory analysis requirement in Executive Order 12044; the Regulatory Analysis Review Group; development of policy on various EPA activities such as prevention of significant deterioration of air quality; beverage container deposit legislation; revisions to the Clean Air, and the Clean Water Acts; minerals policy; and carcinogen regulation; also amendments of the laws governing civil aviation, trucking and communications.

6/76 - 2/77 Senior Economist: Council on Wage and Price Stability. Worked on energy issues. Major activity was as lead economist on the Presidential Task Force on Reform of Federal Energy Administration Regulation.

8/72 - 4/76 Research Associate: The Brookings Institution. First two years were in Foreign Policy Studies working as the economist on an interdisciplinary study on international institutions for managing oceans, outerspace, and weather modification. Last two years were in Economic Studies working with Charles L. Schultze on energy policy and working on safety and health regulation.

9/65 - 6/67 Teaching Assistant: Department of Economics, University of Illinois at Urbana-Champaign.

PUBLICATIONS

"Regulation and Optimal Technological Change: Not Whether but How," in The Changing Nature of Telecommunication/Information Infrastructure, Computer Science and Telecommunications Board, National Research Council, Washington, D.C., National Acadamy Press, 1995.

"Optimal Costing and Pricing Methodologies for Regulated Monopoly Telephone Companies," in William Pollard, Editor, Marginal Cost Techniques for Telephone Services: Symposium Proceedings, Columbus, Ohio, The National Regulatory Research Institute.

Contributor, "The State of Competition in Telecommunications," in Barry G. Cole, Editor, After The Breakup: Assessing the New Post-AT&T Divestiture Era, New York: Columbia University Press, 1991.

Co-Author, "Public Utility Rate-of-Return Regulation: Can It Ever Protect Consumers?" by Nina W. Cornell and Douglas W. Webbink, in Robert W. Poole, Jr., editor, Unnatural Monopolies, Lexington, Mass.: Lexington Books, 1985.

Co-Author, "Access Charge Theory and Implication: A Slip Twixt Cup and Lip," by Michael D. Pelcovits, Nina W. Cornell, and Steven R. Brenner, in Patrick C. Mann and Harry M. Trebbing, Editors, Changing Patterns in Regulation: The Effect on Public Utility Pricing, Proceedings of the Institute of Public Utilities Fourteenth Annual Conference, East Lansing, Michigan: Institute of Public Utilities Graduate School of Business Administration, 1984.

Co-Author, "Toward Competition in Phone Service: A Legacy of Regulatory Failure," by Nina W. Cornell, Michael D. Pelcovits, and Steven R. Brenner, in Regulation, July/August 1983.

Co-Author, "The Present Direction of the FCC: An Appraisal," by Nina W. Cornell and Douglas W. Webbink, American Economic Review, Papers and Proceedings, Vol. 73, No. 2, May 1983.

Co-Author, "Access Charges, Costs, and Subsidies: The Effect of Long Distance Competition on Local Rates," by Nina W. Cornell and Michael D. Pelcovits, in Eli Noam, editor, Telecommunications Regulation Today and Tomorrow, New York: Harcourt Brace Jovanovich, 1983.

"Direct Broadcast to Home Satellites — Boon or Bane to Broadcasting, Cable and the Public: A Panel Discussion," Jurimetrics Journal, Winter 1982.

Co-Author, "Social Objectives and Competition in Common Carrier Communications: Incompatible or Inseparable?" by Nina W. Cornell, Daniel A. Kelley, and Peter R. Greenhalgh, in Harry Trebing, ed., Energy and Communications in Transition, Michigan State University Public Utilities Papers, 1981.

"Rate of Return Regulation: Protecting Whom from What?", Regulation, November/December 1980.

Co-Author, "Common Carrier Regulation and Technological Change: The New Competition in the Communications Industries," by Nina W. Cornell and Douglas W. Webbink, Joint Economic Committee of Congress, Special Study on Economic Change, Volume 5, December 8, 1980.

Co-Author, Policies for Regulation of Direct Broadcast Satellites, by Florence O. Setzer, Bruce A. Franca, and Nina W. Cornell, Staff Report, Office of Plans and Policy, Federal Communications Commission, September 1980.

"For Spectrum Economics," Mobile Times, February 1980; and "More on the Spectrum Economics Debate: Rebuttal for the Proposal," Mobile Times, March 1980.

"The Politics of Policy Analysis," American Journal of Agricultural Economics, Vol. 61, No. 4, part 2, November 1979.

"Can Safety Be Mandated?" Economic Effects of Government-Mandated Costs, Public Policy Research Center, University of Florida, 1978.

Co-Author, Regimes for the Ocean, Outerspace, and the Weather, by Seyom Brown, Nina W. Cornell, Larry L. Fabian, and Edith Brown Weiss, The Brookings Institution, 1977.

Co-Author, "Safety Regulation" by Nina W. Cornell, Roger C. Noll, and Barry Weingast, in Henry Owen and Charles L. Schultze, eds., Setting National Priorities: The Next Ten Years, The Brookings Institution, 1976.

"Manganese Nodule Mining and Economic Rent," Natural Resources Journal, Vol 14, No. 4, October 1974.

SELECTED CONFERENCE PRESENTATIONS

Asilomar Conference on Lifting the MFJ Restrictions, A Symposium Sponsored by The Communications Committee of the National Association of Regulatory Utility Commissioners and the California Public Utilities Commission, Asilomar Conference Center, Pacific Grove, California, January 2-5, 1990

"Emerging IntraLATA Rate Structures and the Impact of IntraLATA Pricing on Competition," presented at the 1988 NARUC Advanced Regulatory Studies Program, Williamsburg, Virginia, February 28, 1988.

"Local Telephone Prices and the Subsidy Question," with Roger C. Noll, presented at the Bell Communications Research Telecommunications Demand Modeling Conference, New Orleans, Louisiana, October 25, 1985.

TESTIMONY — REGULATORY COMMISSIONS

Canadian Radio-television and Telecommunications Commission:

- Inquiry Into Telecommunications Carriers' Costing and Accounting Procedures: Phase III - Costing of Existing Services, 9/30/82.

Public Utilities Board for the Province of Alberta, Canada:

- In the Matter of "The Alberta Government Telephones Act," Being Chapter A-23 of the Revised Statutes of Alberta, 1980, as Amended; And in the Matter of "The Public Utilities Board Act," Being Chapter P-37 of the Revised Statutes of Alberta, 1980, as Amended; and in the Matter of an Application by Alberta Government Telephones to the Public Utilities Board for an Order Approving the Deletion of Certain Basic Terminal Equipment (Voice) Services. (On Proper Conditions to Apply to Local Telephone Company Services in order to have a Competitive Equipment Market), 2/10/83.

Alaska Public Utilities Commission

- In the Matter of Consideration of Regulations Governing the Market Structure for Intrastate Interexchange Telecommunications Service, Docket No. R-90-1, 6/5/90.

Arizona Corporation Commission:

- In the Matter of the Application of the Mountain States Telephone and Telegraph Company, a Colorado Corporation, for a Hearing to Determine the Earnings of the Company, the Fair Value of the Company for Ratemaking Purposes, to Fix a Just and Reasonable Rate of Return Thereon, and to Approve Rate Schedules Designed to Develop Such Return, Docket No. E-1051-84-100, and In the Matter of the Mountain States Telephone & Telegraph Company Filing New Tariff Pages for Approval by the Commission, Which Introduce Access Services, Docket No. E-1051-83-293, 8/23/85.
- In the Matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public in the State of Arizona, Docket No. U-2432-84-003, 1/11/85.
- In the Matter of a General Investigation on the Commission's Own Motion into Competition for Intrastate Interexchange Services, Docket No. U-0000-84-058, 9/4/84.

Arkansas Public Service Commission:

- In the Matter of an Investigation of Intrastate Separations, Settlements and Intrastate Toll Rates of Return, Docket No. 83-042-U, 5/28/85.

Public Utilities Commission of California:

- Order Instituting Rulemaking on the Commission's Own Motion Into Competition for Local Exchange Service; Order Instituting Investigation on the Commission's Own Motion Into Competition for Local Exchange Service; R.95-04-043, et al., 10/27/95.
- Investigation on the Commission's Own Motion into the Second Triennial Review of the Operations and Safeguards of the Incentive-Based Regulatory Framework for Local Exchange Carriers, I. 95-05-047, 9/28/95.
- In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers and Related Matters, I.87-11-033, 5/18/92; 10/9-10/91.

- Application of AT&T Communications of California, Inc. (U 5002 C) under Rule 18 for a Certificate of Public Convenience and Necessity for Authority to Provide Intrastate InterLATA AT&T MEGACOM and AT&T MEGACOM 800 Service; Application of AT&T Communications of California, Inc. (U 5002 C) under Rule 18 for a Certificate of Public Convenience and Necessity for Authority to Provide AT&T PRO sm WATS California; Application of AT&T Communications of California, Inc. (U 5002 C) for Authority to Provide Intrastate AT&T 800 READYLINE Service, A.88-07-020, A.88-08-051, A.89-03-046, 3/2/90, 5/7/90.
- In the Matter of the Application of the Pacific Telephone and Telegraph Company, a corporation, for authority to establish a rate stability plan for Centrex-CO and associated services, to expand Centrex-CO service to smaller line size customers and to lower certain Centrex-CO service rates, Application No. 83-05-45, 12/27-28/83.
- Order Instituting Investigation to determine whether competition should be allowed in the provision of telecommunications transmission services within the state. And related matters. OII 83-06-01, Applications No. 82-12-21, No. 83-10-20, No. 83-05-16, No. 83-05-26, No. 83-05-40, No. 83-06-54, No. 83-07-21, No. 83-08-26, No.83-09-37, Case No. 83-05-05, 9/26-27/83 and 10/21/83.
- In the Matter of the Application of the Pacific Telephone and Telegraph Company, a corporation, for authority to increase certain intrastate rates and charges applicable to telephone services furnished within the State of California due to increased depreciation expense and Related Cases, Application No. 82-11-07, Application Nos. 83-01-22; 83-06-65; OII 83-04-02, 8/25-26/83.

Public Utilities Commission, State of Colorado:

- In the Matter of Costing and Pricing for Telephone Services, Docket No. 92M-039T, 2/24-28/92, 12/1-3/92.
- In Re: Application of Mountain States Telephone and Telegraph Company, D/B/A, U S West Communications, Inc., for Approval of a Five Year Plan for Rate and Service Regulation and for a Shared Earnings Program, Docket No. 90A-655T, 10/28/91.
- In Re: Investigation and Suspension of Proposed Changes in Tariffs Filed by the Mountain States Telephone and Telegraph Company, d/b/a U S West Communications, Inc., in Advice Letter No. 2173, Docket No. 90S-544T, 7/23/91, 7/25/91.
- In Re: Rules Prescribing the Provision of Certain Services within Open Network Architecture, Docket No. 90R-512T, 11/26/90.
- In Re: Investigation of IntraLATA Interexchange Telecommunications Markets in the State of Colorado, Docket No. 89I-082T, 2/22/90.
- Investigation and Suspension of Proposed Changes and Additions to Exchanges in Network Services Tariff—Telephone, Mountain States Telephone and Telegraph Company, Denver, Colorado 80202, I & S Docket No. 1766, 11/29/88.
- William C. Danks, Complainant v. Mile Hi Cablevision, Inc., Mile Hi Cablevision Associates, Ltd., and The Mountain States Telephone and Telegraph Company, Respondents; The Mountain States Telephone and Telegraph Company, Complainant, v. American Television and Communications Corporation, d/b/a American Cablevision of Littleton, Inc., American Cablevision of Thornton, Inc., American Cablevision of Wheatridge, Inc., and American Cablevision of Northglenn, Inc., Respondent, 12/11/85.
- In the Matter of the Application of MCI Telecommunications Corporation for a Certificate of Public Convenience and Necessity to Offer Intrastate Telecommunications Services to the Public in the State of Colorado, Application No. 36337, In the Matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public

in the State of Colorado and for the Establishment of Initial Rates, Application No. 36360, In the Matter of the Authority to Provide Interexchange Switched Voice Telecommunications Service on an IntraLATA Basis in the State of Colorado, Application No. 36456, 11/2/84.

Connecticut Department of Public Utilities:

- DPUC Investigation into the Unbundling of The Southern New England Telephone Company's Local Telecommunications Network, Docket No. 94-10-02, 5/8/95 and 5/19/95.
- DPUC Investigation into the Cost of Service of Southern New England Telephone Company, Docket 94-10-01, 2/2/95; 3/1/95.
- DPUC Investigation into the Rate Structure and Operational and Financial Status of the Southern New England Telephone Company, Docket No. 89-12-05, 5/6/91.
- DPUC Investigation into Authorization of Competition for Intrastate Telecommunications Service Pursuant to P.A. 87-415, Docket No. 87-08-24, 2/4-5/88.
- DPUC Investigation into Competition for Intrastate Interexchange Telecommunications Service, Docket No. 85-06-04, 4/2-3/86 and 5/29-30/86.
- Investigation into Compensation to Telephone Companies by Interstate Common Carriers for Unauthorized Intrastate Calls, Docket No. 85-05-23, 7/9/85 and 7/17/85.

Public Service Commission, State of Florida:

- In re: Petition for Review of Rates and Charges Paid by PATS Providers to LECs, Docket No. 860723-TP, 8/2/90.
- In re: Review of Southern Bell Telephone and Telegraph Company's Capital Recovery Position, Docket No. 890256-TL, 3/29/90.
- In re: Investigation into Equal Access Exchange Areas (EAEAs), Toll Monopoly Areas (TMAs), 1+ Restriction to the Local Exchange Companies (LECs), and Elimination of the Access Discount, Docket No. 880812-TP, 11/2/89.
- In re: An Investigation into the Statewide Offering of Access to the Local Network for the Purpose of Providing Information Services, Docket No. 880423-TP, 2/17/89.
- In re: Investigation into NTS Cost Recovery - Phase II, Docket No. 860984-TP, 3/17/88.
- In re: Investigation into NTS Cost Recovery - Phase I Levels, Docket No. 860984-TP, 9/17/87.
- In re: Intrastate Access Charges for Toll Use of Local Exchange Services - Toll Monopoly Transmission Areas and Bypass Restrictions (Phase I), Docket No. 820537, 5/2/86.
- Application of AT&T Communications of the Southern States, Inc. for a Certificate of Public Convenience and Necessity/Motion for Waiver of Tariff Filing Requirements, Docket No. 830489-TI, 3/13/86.
- In re: Intrastate Access Charges for Toll Use of Local Exchange Services, Docket No. 820537-TP, 9/14/83.
- In re: Petition of MCI Telecommunications Corporation for a Certificate of Public Convenience and Necessity, Docket No. 820450-TP, 3/21/83.
- In the Matter of: Resale of Wide Area Telephone Service and Message Toll Service, Docket No. 1 810239-TP, 1/22/82.
- Application of Microtel, Inc. for a Certificate to Construct and Operate a Microwave System, Docket No. 800333-TP, 11/5/81.

Georgia Public Service Commission:

- Docket No. 3522-U, 8/15/85.
- Application of MCI to Provide Intrastate Toll Service, Docket No. 3446-U, 2/29/84 (Direct testimony only).

State of Illinois, Illinois Commerce Commission:

- In the Matter of Illinois Bell Telephone Company Petition to Regulate Rates and Charges of Non-Competitive Serives Under an Alternative Form of Regulation, Docket No. 92-0448, 8/3/93.
- In the Matter of: Independent Coin Payphone Association and Total Communication Services, Inc. Complaint to Reclassify Illinois Bell Telephone Company Pay Telephone Service as a Competitive Service in Illinois Market Service Area 1 (MSA 1), Docket No. 88-0412, 11/14-15/91, 2/5/92.
- Centel Network Communications, Inc., Application for Certification of Service Authority Pursuant to Sec. 13-404; and For Other Authority and Waivers of Commission Rules and Regulations, Docket No. 89-0132, 1/16/90.
- In the Matter of Illinois Bell Telephone Company and Commonwealth Edison Company, Illinois Power Company, Central Illinois Light Company, Central Illinois Public Service Company, and the Illinois Telephone Association and Illinois Cable Television Association, Docket Nos. 86-0192, 86-0228, 86-0229, 3-15-88, 3-22-88.
- In the Matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity pursuant to section 55 of the Illinois Public Utilities Act, to Provide INTRA-MSA Telecommunications Services Within the State of Illinois, No. 83-0634, 11/14/84.
- In the Matter of the Application of AT&T Communications of Illinois, Inc. for the issuance of a Certificate of Public Convenience and Necessity to provide interexchange/INTER-MSA telephone and telecommunications services between and among Market Service Areas in the State of Illinois, 83-0648, 6/15/84.
- Satellite Business Systems Application for a Certificate of Public Convenience and Necessity pursuant to Section 55 of the Illinois Public Utilities Act, to provide INTER-MSA Telecommunications Services Within the State of Illinois, 84-0025, 4/30/84.
- GTE Sprint Communications Corporation Application for a Certificate of Public Convenience and Necessity pursuant to Section 55 of the Illinois Public Utilities Act, to Provide INTER-MSA Telecommunications Services Within the State of Illinois, 83-0633, 2/16/84.

Indiana Utility Regulatory Commission:

- In the Matter of the Complaint of the Indiana Payphone Association, Incorporated, an Indiana Not-For-Profit Incorporated Association, Complainant, v. Indiana Bell Telephone Company, Inc., Respondent, Cause No. 39474, 5/31/94, 6/2/94.
- Petition of MCI Telecommunications Corporation for a Certificate of Territorial Authority to Provide Intercity Telecommunications Services Within Indiana, Cause No. 37240, 10/3/83 and 11/21/83.

Iowa Utilities Board

- In re: IntraLATA Presubscription, Discounted Access Charges, and Imputed Access Charges, Docket No. INU-90-1, 8/13/90.
- Docket No. RPU-84-2, 10/17/84.

Public Service Commission of the Commonwealth of Kentucky

- In the Matter of An Inquiry into IntraLATA Toll Competition, an Appropriate Compensation Scheme for Completion of IntraLATA Calls by Interexchange Carriers, and WATS Jurisdictionality, Administrative Case No. 323, 12/13/89, 10/29/90.

Louisiana Public Service Commission

- In the Matter of Investigation of the Revenue Requirements, Rate Structures, Charges, Services, Rate of Return and Construction Program of South Central Bell Telephone Company of its Louisiana Intrastate Operations, the Appropriate Level of Access Charges, and All Matters Relevant to the Rates and Service Rendered by the Company, Docket No. U-17949-B (Generic Phase), 12/10/90 and 5/8/91.
- In the Matter of US Sprint Custom Network Services Tariff (UltraWATS Service), Docket No. U-17644, American Telephone and Telegraph Communications of South Central States Inc. (Megacom Service, Docket No. U-17578, and MCI Telecommunications Company Custom Network Services Tariff (Prism I and II), Docket No. U-17767.

Public Service Commission of Maryland:

- In the Matter of the Application of MFS Intelenet of Maryland, Case No. 8584, Phase II, 8/10/95.
- In the Matter of the Investigation by the Commission on Its Own Motion into Legal and Policy Matters Relevant to the Regulation of Firms, Including Current Telecommunications Providers and Cable Television Firms, Which May Provide Local Exchange and Access Services in Maryland in the Future, Case No. 8587, 8/8/94.
- In the Matter of the Application of MFS Intelenet of Maryland, Case No. 8584, 2/3/94.
- In the Matter of the Investigation by the Commission on its own Motion into the Rates and Charges of AT&T Communications of Maryland, Inc., Case No. 7941, 6/4/86, 7/10/86.
- In the Matter of the Application of MCI City Telecommunications Corporation for Authority to Provide Intercity Telecommunications Service within the State of Maryland, Case No. 7719, 8/29/83 and 11/29/83.

Commonwealth of Massachusetts, Department of Public Utilities:

- Investigation by the Department of Public Utilities on its Own Motion into IntraLATA and Local Exchange Competition in Massachusetts, D.P.U. No. 94-185, 7/7/95, 10/2/95.
- Petition for an Advisory Ruling as to the Competitive Nature of Public Pay Telephone Service, D.P.U. 88-45, November or December, 1988.
- Investigation by the Department of the cost studies filed by New England Telephone and Telegraph Company on April 18, 1986, pursuant to the Department's Orders in D.P.U. 1731, D.P.U. 86-33, 5/22-23/88.
- Investigation by the Department on its own motion as to the propriety of the rates and charges set forth in the following rates schedules: DPU Mass. No. 10, Part C - Sec. 7, Original of table of contents, page 1, Original of pages 1 thru 6, filed with the Department on December 15, 1987 to become effective January 14, 1988 by the New England Telephone and Telegraph Company, D.P.U. 88-13, 5/21-22/88.
- In the Matter of New England Telephone Company, Re: D.P.U. 86-33, D.P.U. 86-124, 9/16/86, 6/18-19-87, 8/3-4/87.
- Petition of the Attorney General for a Generic Adjudicatory Proceeding Concerning Intrastate Competition by Common Carriers in the Transmission of Intelligence by Elec-

tricity, Specifically as with Respect to IntraLATA Competition, and Related Issues, Filed with the Department on December 20, 1983, D.P.U. 1731, 7/19-20/84.

- Investigation by the Department on its Own Motion as to the Propriety of the Rates and Charges Set Forth in a Tariff for Carrier Access Charges filed by the New England Telephone and Telegraph Company with the Department on October 21, 1983, to Become Effective November 20, 1983, D.P.U. 1661, 2/22/84.

Public Service Commission of the State of Michigan:

- An Inquiry, on the Commission's Own Motion Into the Status of Competition in the Provision of Telecommunications Services, Case No. U-8716, 6/10/87.
- In the Matter of the Applications of MCI Telecommunications Corporation for special temporary authority or alternatively, for a finding of no jurisdiction over its proposed service, Case No. U-7853, and In the Matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public in the State of Michigan, Case No. U-7873, 5/8/84.

Minnesota Public Utilities Commission:

- In the matter of a consolidated proceeding to investigate the provision of intrastate intercity telecommunications services within the State of Minnesota, Docket No.P-422, P-442, P-444, P-421, P-433/NA-84-212, 2/5-6/85.

Missouri Public Service Commission:

- In the matter of proposals to establish an alternate regulation plan for Southwestern Bell Telephone Company, Case No. TO-93-192, 8/93 (no cross examination).
- In the matter of Southwestern Bell Telephone Company's Application for Classification of its Non-Basic Services, Case No. TO-89-56, 11/2/90.
- The Staff of the Missouri Public Service Commission, Complainant, v. Southwestern Bell Telephone Company, A Missouri Corporation, Respondent, Case No. TC-89-14, et al., 1/31/89 and 4/11/89.
- CyberTel Cellular Telephone Company, Complainant v. Southwestern Bell Telephone Company, Respondent, Case No. TC-86-158; Midwest Cellular Telephone Company, Complainant v. Southwestern Bell Telephone Company, Respondent, Case No. TC-87-39; and In the Matter of the Applications of Southwestern Bell Telephone Company for Approval of a New Radio Common Carrier Interconnection Service Tariff, Case No. TR-87-58, 7/1/87.
- In the Matter of the Application of MCI Telecommunications Corporation for a Certificate of Public Convenience and Necessity to offer telecommunications service in Missouri, Case No. TA-84-82, and In the Matter of the Application of GTE Sprint Communications Corporation for a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public in the State of Missouri, Case No. TA-84-114, 8/8-9/84.

Montana Public Service Commission

- Presentation on Building Blocks, January 22, 1993.

Nebraska Public Service Commission:

- In the Matter of the Application of GTE Sprint Communications Corporation For a Certificate of Public Convenience and Necessity to Offer Intercity Telecommunications Services to the Public in the State of Nebraska, Docket C-497, 3/7/85.

- In the Matter of the Application of Northwestern Bell Telephone Company, Omaha, Nebraska, for Approval of Tariff Sheets of its General Exchange Tariff, Application No. C-353, 5/5/83.
- In the Matter of the Effect of Competition in Inter-exchange Telephone Service, Application No. C-506, 9/6/84.

Public Service Commission of Nevada:

- The Application of Centel Network Communications, Inc., for a Certificate of Public Convenience and Necessity, to Operate as an Intrastate and InterLATA Resale Carrier, Docket No. 88-1156, 4/20-21/89.

New Hampshire Public Utilities Commission

- Re: DE 90-002 - Generic Competition Docket, 9/24/92.

New Jersey Department of Energy, Board of Public Utilities:

- In the Matter of the Application of New Jersey Bell Telephone Company of Approval of its Plan for an Alternative Form of Regulation, Docket No. T092030358, 10/5/92.
- In the Matter of Investigation of Intrastate Tele-communications Competition, BPU Docket 8312-1126, Direct and Rebuttal Testimony, 1/31/84.

New Mexico State Corporation Commission

- In The Matter Of The Rates And Charges Of U S WEST Communications, Inc., Docket No. 92-227-TC, 3/11/93.

New York State Public Service Commission:

- Proceeding on Motion of the Commission to Investigate Performance-Based Incentive Regulatory Plans for New York Telephone Company, Case No. 92-C-0665, 12/12/94.
- Petition of Rochester Telephone Corporation for Approval of Proposed Restructuring Plan, Case 93-C-0103 and Petition of Rochester Telephone Corporation for Approval of New Multi-Year Rate Stability Agreement, Case 93-C-0033, by affidavit, 8/94.
- Proceeding on Motion of the Commission to Investigate Performance-Based Incentive Regulatory Plans for New York Telephone Company, Case No. 92-C-0665, 10/7/93.
- Proceeding on Motion of the Commission to Review Regulatory Policies for Segments of the Telecommunications Industry Subject to Competition, Case No. 29469, 9/28-29/87.

North Carolina Utilities Commission:

- In the Matter of Investigation to Consider Whether Intrastate Offerings of Long Distance Telephone Service Should be Allowed in North Carolina and What Rules and Regulations Should be Applicable to Such Competition if Authorized, P-100, Sub 72, 10/24/84.
- In the Matter of: Resale of Intrastate Telecommunications Services, Docket No. P-100, Sub 61, 11/16/82.

Public Utilities Commission of Ohio:

- In the Matter of the Commission's Investigation Relative To Establishment of Intrastate Access Charges, Case No. 83-464-TP-COI, 10/17/83.

Oklahoma Corporation Commission:

- In re: Inquiry of the Oklahoma Corporation Commission Concerning the Regulation of Intrastate InterLATA Carriers, Cause No. 29217, 11/16/84.
- In re: Application of MCI Telecommunications Corporation, Cause No. 28713, 3/26/84.

Public Utility Commission of Oregon:

- In the Matter of the Investigation into the Cost of Providing Services, Docket UM 351, Phase II: Unbundling and Pricing Issues, 10/20/95.
- In the Matter of the Application of MCI Access Transmission Services, Inc. for a Certificate of Authority to Provide Local Exchange Telecommunications in Oregon, Docket No. CP 15, 7/12/95.
- In the Matter of the Revised Rate Schedules Filed by U S West Communications, Inc. for toll service. Advice No. 1291, Docket No. UT 94, 8/30/90.
- In the Matter of the Investigation into the Revenue Requirements and Rate Spread of Pacific Northwest Bell Telephone Company, dba U S West Communications, Docket No. UT 85, 6/8/89.
- In the Matter of the Petition of Pacific Northwest Bell Telephone Company d/b/a U S West Communications, Inc., to Price List Telecommunications Services Other Than Essential Local Exchange Services, Docket No. UT 80, 6/8/89.
- In the Matter of an Investigation Into Presubscription, Exchange Carrier Toll Rates, and Antitrust Implications of the "IntraLATA Access Charges Agreement" Proposed by Pacific Northwest Bell Telephone Company and the Oregon Independent Telephone Association, Docket No. UT-47, 3/18/87.

Pennsylvania Public Utilities Commission:

- Application of MFS Intelenet of Pennsylvania, Inc., For Approval to Operate As a Local Exchange Telecommunications Company, Docket No. A-310203F002, 2/9/95.
- In the Matter of the Bell Telephone Company of Pennsylvania's Petition for An Alternative Form of Regulation Under Chapter 30, Docket No. P-00930715, 2/7/94.
- Generic Access Charge Investigation, Docket No. P-830452, 11/3/83, 3/21-22/84.

South Carolina Public Service Commission:

- In re: Application of MCI Telecommunications Corporation for a Certificate of Public Convenience and Necessity, Docket No. 84-181-C, 7/23-24/84.

Public Utilities Commission of the State of South Dakota:

- In the Matter of the Inquiry into the Competitive Status of Private Line and Special Access Services in South Dakota, F-3741; In the Matter of the Inquiry into the Competitive Status of Cellular Radio Services, Premise Cable and Inside Wire, Centron and Centron-Like Services, and Billings and Collections Services in South Dakota, F-3742; In the Matter of the Inquiry into the Competitive Status of MTS, WATS, and New Products and Services in South Dakota, F-3743; In the Matter of the Inquiry into the Competitive Status of Optional Services in South Dakota, F-3744, 1/16 & 1/19/89.

Public Service Commission, State of Tennessee:

- South Central Bell Telephone Company v. Southeastern Telecommunications, Inc. and Intercall, Inc. TPSC Docket No. U-82-7167 (on resale), 7/3/82 and 7/7/82.

Public Utilities Commission of Texas:

- Complaint of Intellicall, Inc Against Private Coin Phone Rates and Practices of Southwestern Bell Telephone Company; Complaint of Advanced Telecom Systems, Inc., Against Private Coin Phone Rates and Practices of Southwestern Bell Telephone Company; Complaint of Intellicall, et al. Against Private Coin Phone Rates and Practices of Southwestern Bell Telephone Company; Application of Southwestern Bell Telephone Company to Revise its Private Coin Service Tariff, Docket Nos. 7122, 7123, 7124, 7152, 6/29-30/87 (Deposition - case subsequently settled.)
- In re: Petition of the PUC of Texas for an Inquiry Concerning the Effects of the Modified Final Judgment and the Access Charge Order upon Southwestern Bell Telephone Company and the Independent Telephone Companies of Texas, Docket No. 5113, 11/8/83.
- In the Matter of the Petition of Southwestern Bell Telephone Company for Authority to Change its Rates, Docket No. 4545, 11/3/82.

Utah Public Service Commission:

- In the Matter of Restructuring the Utah Intrastate Universal Service Fund Which Was Established in Docket No. 89-999-01, Docket No. 93-999-05, November 8, 1994.
- In the Matter of the Request of U S WEST Communications Inc. for an Increase in its Rates and Charges, Docket No. 94-049-05, 2/1/93.
- In the Matter of the Application of U S West Communications for Approval of an Incentive Regulation Plan, Docket No. 90-049-03, and In the Matter of the Investigation into the Reasonableness of the Rates and Charges of U S West Communications, Docket No. 90-049-06, 3/7/91.
- In the Matter of Mountain States Telephone and Telegraph Company, Case No. 88-049-07, 5/24/89.

Vermont Public Service Board:

- Investigation into NET's tariff filing re: Open Network Architecture, including the unbundling of NET's network expanded interconnection and intelligent networks, Docket No. 5713, 8/31/95.
- Petition of New England Telephone and Telegraph Company, Docket Nos. 5700 and 5702, 6/22/94, 7/21/94.
- Investigation of Proposed Second Vermont Telecommunications Agreement, Docket No. 5540, 2/14/92.
- Joint Petition of New England Telephone and Telegraph Company and the Vermont Department of Public Service Requesting Approval of the Vermont Telecommunications Agreement of October 14, 1987, Docket No. 5252, 5/2-3/88.

Virginia State Corporation Commission:

- Ex Parte, in re: Investigation to Consider the Impact of Modified Final Judgment in United States v. American Telephone & Telegraph Company, Civil Nos. 74-1698 and 82-0192, 552 F. Supp. 131 (D.D.C. 1972) and In the Matter of MTS and WATS Market Structure, FCC Docket No. 78-72 (Feb. 28, 1983) on the Provision of Toll Service in Virginia, Case No. PUC830020, 9/10-11/86.
- Petition of AT&T Communications of Virginia for Authority to Set Rates and Charges Pursuant to 1 of the Code of Virginia, Virginia Case No. PUC 840023, 7/30-31/84.
- Application of MCI Telecommunications of Virginia for a certificate of public convenience and necessity to provide inter-LATA, inter-exchange telecommunications service and to have rates established on competitive factors, Virginia Case No. PUC 840022, 7/27/84.

Washington Utilities and Transportation Commission:

- Washington Utilities and Transportation Commission vs. U S West Communications, Inc., Docket No. UT-941464, et al, 6/28/95.
- Northwest Payphone Association, et al. v. U S WEST Communications, Inc., Docket UT-920174, 2/2/93, 12/13/93.
- Washington Utilities and Transportation Commission, Complainant, vs. U. S. West Communications, Respondent, Docket Nos. UT-911488, UT-911490, and UT-920252, 9/28-29/92, 2/9/93.
- In the Matter of Pacific Northwest Bell D/B/A U S West Communications Petititon for an Alternative Form of Regulation, Docket No. U-89-3245-P, 11-28-89.
- Washington Utilities and Transportation Commission vs. Pacific Northwest Bell Telephone Company, Docket No. U-87-1083-T, 3-7-88.
- In the Matter of the Petition of AT&T Communications of the Pacific Northwest, Inc. for Classification as a Competitive Telecommunications Company, Cause No. U-86-113, 4/6/87.
- Washington Utilities and Transportation Commission, Complainant, vs. Pacific Northwest Bell Telephone Company, Petitioner and Respondent, Consolidated Cause Nos. U-86-34, U-86-35, U-86-36, U-86-86, U-86-90, 12/14-17/86, 2/9/87.
- In the Matter of the Petition of MCI Telecommunications Corporation for Classification as a Competitive Telecommunications Company, Cause No. U-86-79, 9/2-3/86.
- Washington Utilities and Transportation Commission v. Pacific Northwest Bell Telephone Company et al., Cause No. U-85-23 et al., 4/29/86.

West Virginia Public Service Commission:

- Case Nos. 85-259-T-SC, et al., 1/27/86, 2/18/86.
- Case Nos. 85-282-T-GI and 85-022-T-P, 10/29/85.
- Case No. 83-259-T-SC, 11/1/83.

Public Service Commission, State of Wisconsin:

- Investigation of Intrastate Interexchange Access Charges and Related IntraLATA and InterLATA Compensation Matters, Docket No. 05-R-5, Part C, 2/2/87.
- Investigation of Application of MCI Telecommunications Corporation for Certificate of Public Convenience and Necessity to Offer Intrastate Toll Services (Petition for Interim InterLATA Authority), Docket No. 3258-NC-1, 10/29/84.
- In the Matter of: Proposed Tariff of Wisconsin Telephone Company for Centrex-CO Rate Stability, Docket No. 6720-TR-35, 3/15/83.

Public Service Commission, State of Wyoming

- In The Matter of the Joint Application of U S West Communications, Inc., and Range Telephone Cooperative, Inc., for Authority for U S West to Sell to Range Telephone the Following Telephone Exchanges, I.E. Gas Hills, Albin, Newcastle, Moorcroft, Thermopolis, Kaycee, Jeffrey City, Carpenter, Osage, Upton, Shoshoni, Pine Bluffs, Burns, Hulett, Worland, and Midwest, and for a Transfer of Requisite Certificate Authority, Docket Nos. 70000-TA-93-151 and 70001-TA-93-7, 9/28/93.
- In the Matter of a General Inquiry by the Public Service Commission into the Telecommunications Needs and Capabilities in Wyoming, General Order No. 67, 8/12/93.

- In the Matter of the Joint Application of U S West Communications, Inc. and Tri County Telephone Association, Inc., for Authority for U S West to Sell to Tri County the Following Telephone Exchanges, I.E., Lovell, Meeteetse, Greybull, Frannie and Basin, and for a Transfer of Requisite Certificate Authority, Docket No. 70000-TA-93-150 and Docket No. 70011-TA-93-8, 8/12/93; 9/30/93; 10/1/93.

TESTIMONY — US CONGRESS

Before the:

- House Judiciary Committee, Subcommittee on Courts, Civil Liberties, and the Administration of Justice, 10/27/83, [Economic Impacts of Repeal of the First Sale Doctrine for Audio-visual Works].
- Senate Committee on the Judiciary, Subcommittee on Patents, Copyrights and Trademarks, 10/25/83 [Home Taping of Audio and Video Works].
- Senate Committee on the Judiciary, Subcommittee on Patents, Copyrights and Trademarks, 4/29/83, [Economic Impacts of repealing the First Sale Doctrine for audio-visual Works].
- House Committee on the Judiciary, Subcommittee on Courts, Civil Liberties and the Administration of Justice, 9/22/82, Copyright Aspects of Home Audio Taping].
- Senate Committee on the Judiciary, 4/21/82, [Copyright Aspects of Home Videotaping].
- House Committee on the Judiciary, Subcommittee on Courts, Civil Liberties and the Administration of Justice, 4/13/82, [Copyright Aspects of Home Videotaping].
- Senate Committee on the Judiciary, 7/23/81, [Monopolization and competition in the Telecommunications Industry: Duties of the FCC under S.898].
- House Committee on Energy and Commerce, Subcommittee on Telecommunications, Consumer Protection, and Finance, 5/27/81, [Status of Competition and Deregulation in the Telecommunications Industry: Local Distribution].
- Senate Committee on Government Affairs, Subcommittee on Oversight of Government Management, 10/10/79, [FCC Compliance with Executive Order 12044].
- House Committee on Interstate and Foreign Commerce, Subcommittee on Communications, 6/6/79, [Communications Act of 1979].
- Senate Committee on Commerce, Science and Transportation, Subcommittee on Communications, 6/18/79, [Spectrum Management].

TESTIMONY — COURT CASES

- Clear Communications Limited v. Telecom Corporation of New Zealand Limited, et al., High Court of New Zealand, Wellington Registry, 6/24-26/92, 9/11/92.
- United States Football League, et al., v. National Football League, et al., United States District Court Southern District of New York, 84 Civ. 7484 (PKL), 6/17-19/86.
- International Telemeter Corporation v. Hamlin International Corporation, U.S. District Court - Western District of Washington, No. C76-487, 9/9-10/81.
- U.S. v. AT&T, U.S. District Court for the District of Columbia, Civil Action No. 74-1698, 6/19/81.

TESTIMONY — ARBITRATIONS

- In the Matter of An Arbitration Before the Right Honourable Sir Duncan McMullin Between Clear Communications Limited, Plaintiff, and Telecom Corporation of New

Zealand Limited, Telecom Auckland Limited, Telecom Central Limited, Telecom Wellington Limited and Telecom South Limited, Defendents, 6/24/93.

ADDITIONAL ASSIGNMENTS, NO FORMAL TESTIMONY

- Consultation with Austel on implementation of a Decision-Making Framework for reviewing new proposed tariffs for anticompetitive effects, 5/94-6/94.
- Docket UM 351 Before the Public Utility Commission of Oregon, In the Matter of the Investigation into the Cost of Providing Telecommunications Services, Participation in Workshops on costing (Phase I), 8/90-6/94; Participation in Workshops on pricing (Phase II), 7/93-10/94.
- Civil Action No. 87-59-WS, General Electric Company, Plaintiff, vs. Thomas J. Zuchowski, Defendent; Civil Action No. C-87-249-WS, General Electric Company, Plaintiff, vs. R Squared Scan Systems, Inc., Defendent; and Civil Action No. C-90-78-WS, General Electric Company, Plaintiff, vs. R Squared Scan Systems, Inc., Defendent; participation for R Squared Scan Systems, Inc., in preparation for testifying on liability of General Electric Company for antitrust abuse of copyrighted software for maintaining and repairing computer assisted tomography scanners (CAT scanners), 1987-1991.

FILINGS — State Commissions

"Economic Efficiency and Unbundling the Monopoly Bottleneck: Incompatible or Indispensible?" A Response to the Economic Arguments made by Timothy J. Tardiff, Richard D. Emmerson, and Peter W. Huber on February 8, 1994, on Behalf of Pacific Bell in Docket R.93-04-003 andDocket I.93-04-002 of the California Public Utilities Commission; March 31, 1994

FILINGS — FCC

"Accounting Separations: A Contradiction in Terms," with Michael D. Pelcovits, Appendix I to Reply Comments of Lee Enterprises, Incorporated, Before the FCC, January 21, 1986, in CC Docket No. 85-229 (Third Computer Inquiry), Attachment to the Written Testimony of Robert D. Ross, President, Call-It Co., Before the Subcommittee on Telecommunications, Consumer Protection & Finance, March 13 Hearing to Examine the Competitive Status of the Bell Operating Companies: Diversification and Its Impact upon Consumers.

FILINGS — COURT

Affidavits Before the United States District Court for the District of Columbia, Civil Action 82-0192, October, 1990; May, 1987.

EDUCATION

Ph. D. (Economics), University of Illinois at Urbana-Champaign, June 1972. Doctoral Dissertation: "The Role of the Nobility in Agricultural Change in Russia During the Reign of Catherine II".

M.A. (Economics), University of Illinois at Urbana-Champaign, June 1967.

A.B. (Economics), Swarthmore College, Swarthmore, Pennsylvania, June 1964.

AWARDS

1978-79 Harold and Margarett Sprout Award for the outstanding study on international ecological or environmental affairs.

PROFESSIONAL ASSOCIATION

American Economic Association

OTHER ACTIVITIES

1986-1988: Representative of the American Economic Association on the Executive Committee of the Consortium of Social Science Associations

1986-1988: Ex Officio Member, American Economic Association Committee on Economic Statistics

PERSONAL

BORN: February 17, 1942, in Boston, Massachusetts