ORIGINAL

BELLSOUTH TELECOMMUNICATIONS, INC.

DIRECT TESTIMONY OF JAMSHED K. MADAN,

MICHAEL D. DIRMEIER AND DAVID C. NEWTON

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 00761-TP

NOVEMBER 15, 2000

INTRODUCTION

Q. PLEASE STATE YOUR NAMES AND BUSINESS ADDRESSES.

A. My name is Jamshed K. Madan. I am a founding Principal of Georgetown Consulting Group Inc. (GCG or Georgetown). The business address of Georgetown is 716 Danbury Road, Ridgefield, Connecticut 06877.

My name is Michael D. Dirmeier. I am a Principal of Georgetown.

My name is David C. Newton. I am a consulting telecommunications network engineer. My business address is 75 Squires Glen, Madison, Connecticut 06443.

Q. MR. MADAN, PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I graduated from the Massachusetts Institute of Technology (M.I.T.) in 1966 with a Bachelor of Science Degree in Electrical Engineering. I continued my graduate studies at M.I.T., graduating in 1968 with a Master of Science Degree in Management

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from the Alfred P. Sloan School of Management.

From August, 1968 through April, 1979, I was employed by Touche Ross & Company, an international public accounting firm (currently merged into DeLoitte and Touche). I was promoted to Principal in September 1977 and held the position of National Director of Regulatory Consulting. I left Touche Ross & Company to become a founding Principal of Georgetown in May, 1979.

I have testified extensively on public utility matters before various regulatory bodies. My resume is attached to this testimony as Exhibit A and incorporated herein by reference.

Q. MR. DIRMEIER, PLEASE STATE YOUR BACKGROUND AND EXPERIENCE.

A. I received a Bachelor of Science Degree in Physics in 1971 from Texas A&M University. In 1973, I received my Masters of Business Administration in Finance from the University of Chicago. I also hold a Certificate in Management Accounting.

From January, 1974 to June 1976, I was employed by the Bendix Corporation as a financial planning analyst. From July, 1976 to April 1979, I held the position of consultant and senior consultant in the consulting division of Touche Ross & Company. In 1979, I joined Georgetown, where since 1983, I have held the position of Principal.

I have testified on numerous occasions before various regulatory bodies. My resume

is attached as Exhibit B and incorporated herein by reference.

Q. MR. NEWTON, PLEASE DESCRIBE YOUR BACKGROUND AND EXPERIENCE.

A. I have spent 34 years in telecommunications network design, planning and implementation. The first 27 of those years was spent in service with the Southern New England Telephone Company, where during the last 10 years I held a series of management positions directing network design, planning and deployment. Since 1991, I have served as a consulting telecommunications network engineer, advising clients and testifying in regulatory proceedings on a variety of network matters. My resume is attached as Exhibit C and incorporated herein by reference.

Q. HAS THIS WITNESS PANEL PREVIOUSLY APPEARED BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION?

A. Yes. In 1998 this panel of witnesses appeared before this Commission on behalf of BellSouth telecommunications Inc., in Docket No. 980696-TP.

Q. PLEASE EXPLAIN THE DIVISION OF RESPONSIBILITIES WITHIN THIS PANEL.

A. Mr. Madan has overall responsibility for the analyses made and the conclusions reached in this testimony. He serves as the principal spokesperson for the panel. Mr. Dirmeier is responsible for the evaluation and operation of the cost model. Mr.

Madan and Mr. Dirmeier share responsibility for developing the cost analyses. Mr. Newton is responsible for engineering and network analyses of the wireless and wireline networks that have assisted Mr. Madan and Mr. Dirmeier in analyzing Sprint PCS's position.

PURPOSE AND SCOPE OF TESTIMONY

Q. PLEASE STATE ON WHOSE BEHALF YOU OFFER THIS TESTIMONY, ITS SCOPE AND ITS PURPOSE.

A. This testimony is submitted on behalf of BellSouth Telecommunications, Inc. ("BellSouth"). BellSouth engaged Georgetown to evaluate Sprint PCS's cost model and proposed reciprocal compensation rate to determine its adequacy and consistency with the requirements of the Telecommunications Act of 1996 ("1996 Act") and applicable Federal Communications Commission ("FCC") orders. This testimony will discuss the adequacy of Sprint PCS's filing to support its proposed reciprocal compensation rate, will review the regulatory history and context regarding reciprocal compensation and its application to Sprint PCS's proposal and will address certain policy considerations that are implicated by Sprint PCS's request for asymmetrical compensation.

OVERALL ASSESSMENT AND RECOMMENDATION

Q. PLEASE SUMMARIZE YOUR OVERALL ASSESSMENT AND EVALUATION OF SPRINT PCS'S COST MODEL AND THE RESULTANT RECIPROCAL COMPENSATION RATE.

A. Georgetown has evaluated Sprint PCS's cost model and rate proposal with regard to the appropriate economic theory previously mandated by the FCC. Based on our evaluation, we conclude that Sprint PCS's cost model is fundamentally and fatally flawed such that it cannot be relied upon by the Commission for determining an appropriate asymmetrical reciprocal compensation rate as proposed by Sprint PCS, assuming that such a rate were otherwise appropriate. Sprint PCS's cost study does not comport with regulatory requirements and does not properly determine the additional costs caused by BellSouth-originated traffic that terminates on Sprint PCS's wireless network. The asymmetrical reciprocal compensation rate proposed by Sprint PCS far exceeds any reasonableness check that can be performed based on the data provided. Therefore, we recommend that the Commission reject Sprint PCS's proposal for both practical and policy reasons.

Q. PLEASE ELABORATE ON THE PRACTICAL PROBLEMS WITH SPRINT PCS'S COST STUDY AND EXPLAIN YOUR CONCLUSION THAT THE SPRINT PCS STUDY IS FATALLY FLAWED AND CANNOT BE USED TO DETERMINE AN ASYMMETRICAL COST FOR RECIPROCAL COMPENSATION IN THIS PROCEEDING.

A. The basic concept that Sprint PCS is trying to present is that BellSouth should be required to pay the appropriate "additional costs" that Sprint PCS would incur when terminating a BellSouth-originated call. Sprint PCS witness Hunsucker, at page 7 of his testimony, states that this Commission should allow Sprint PCS to have asymmetrical reciprocal compensation if it can prove that its cost study is consistent with the FCC's pricing rules. Sprint PCS witness Farrar, beginning at page 4 of his

testimony, describes these rules as requiring that the appropriate Total Element Long Run Incremental Cost ("TELRIC") be determined. Therefore, Sprint PCS is evidently asserting that its cost study submitted in this proceeding provides the TELRIC-based cost of terminating a BellSouth-originated call on Sprint PCS's network. The simple truth of the matter, however, is that the results presented by Sprint PCS in this case cannot possibly be in accord with the FCC's TELRIC pricing rules, as alleged by Sprint PCS's witnesses.

Q. CAN YOU EXPLAIN WHY YOU ASSERT THAT THE RESULTS OF THE SPRINT PCS COST STUDY CANNOT BE TELRIC-BASED COSTS AS PRESCRIBED BY THE FCC?

A. Yes. Mr. Farrar correctly defines TELRIC on page 5 of his testimony. A TELRIC-based cost is a cost calculated by determining the forward-looking cost of an element, based on the use of the most efficient telecommunications technology currently available and the lowest cost network configuration. However, that is clearly not what Sprint PCS has done with its study. Specifically, Sprint PCS shows in its study that its cost per minute of use was expected to be 9.3 cents in 2000, 6.6 cents in 2001 and 5.0 cents in 2002, a 46% decline. [Exhibit 1].

Since the input unit cost of the various components of equipment did not change over this period, the obvious conclusion is that the effective utilization of the network, or the "fill" factor, is changing year over year. As shown by Sprint PCS's own study, per minute costs decline dramatically as utilization increases. These results clearly mean that the investment included in the cost study has a capacity that in many cases is far

in excess of the actual and projected usage for the duration considered in the cost study. Since the FCC requires that the determination of additional costs for reciprocal compensation purposes be based on an efficiently configured and operated network, a network that is obviously not functioning at an optimum level cannot properly reflect the forward looking incremental costs of terminating calls on Sprint PCS's network.

We asked Sprint PCS what that fill factors were used in the study, and were told, rather than being given a percentage fill factor, that the "Sprint PCS Cost Model implicitly utilizes the actual fill factors experienced by Sprint PCS."[1] This presents an obvious problem. The relevant costs that should be considered in a proper cost study should be the costs divided by the total capacity of the system reflecting reasonable utilization levels. That clearly was not done here and we do not have any information that would allow for the correction of this defect. Therefore the results of the study are useless for setting rates.

Q. CAN YOU ELABORATE ON WHY YOU CONCLUDE THAT THIS IS A PROBLEM?

A. Certainly. Sprint PSC has had to build out its network to serve the area that it received authority to serve. It had to build cell sites in strategic places around its service area, whether it expected a lot of traffic in those areas or not. This build-out was necessary to have appropriate coverage so that its customers could have a signal

[1] Sprint PCS response to BellSouth Interrogatory 54.

anywhere in the appropriate service area. With the initial build-out, one can only presume that a lot of cell sites were built that had little usage at first. Even in those areas where there was a sparse population, a mobile switching office, and all the other facilities necessary to get a call to or from a mobile unit had to be built out. As a result, the actual utilization or fill factor for a particular switch or cell site might well be very low.

Even in Sprint PCS's analysis this phenomenon is apparent. Evidently when they build a cell site, they have a Base Transceiver System ("BTS") that starts with only one channel. As demand increases, they add more channels until they reach a maximum of three, when they have to split the cell site.

All of this means that, in a growing system that is not fully mature, the capacity of the system will exceed the actual demand. The impact of this situation is clear. If you incur an expense of $100 to build a facility, but you only use 10% of its capacity, with 1000 minutes of use, each minute costs 10 cents. If the facility operates at 70 percent of capacity, or 7000 minutes, each minute of use costs 1.4 cents. What we have been able to tell from Sprint PCS's cost study is that it is not operating anywhere near capacity, since *their study* indicates that the cost per minute over the three years for which they have given us information, will fall 46%. For all this Commission can tell from the cost study that Sprint PCS has provided, the cost per minute reflected in the study is based on inputs that utilize only 20 or 30% of the system's capacity.

Since TELRIC pricing is supposed to determine the cost that would be incurred by an efficient telecommunications firm using the lowest cost network configuration,

without evidence that the "fill" factors offered by Sprint PCS are those that reflect the "lowest cost network configuration," the Commission has no basis to conclude that Sprint PCS's cost study does what it purports to do.

Q. ARE THERE ANY OTHER GENERAL COMMENTS YOU CAN MAKE REGARDING THE VALIDITY OF THE SPRINT PCS COST STUDY?

A. Yes. Another problem with the cost study is that Sprint PCS has obviously included items in the cost study that it asserts to be traffic sensitive that in fact should not be included in a TELRIC cost study for reciprocal compensation purposes. For instance, Sprint PCS has included spectrum in the cost study, treating it as if it were a depreciable asset. In fact, in order to operate any network at all, even if it only had one customer, Sprint PCS had to purchase the spectrum. Moreover, once it had the spectrum, it has it forever. It doesn't go away, get used up or otherwise diminish. It should be treated just like the local loop in the wireline network for purposes of reciprocal compensation, where the loop is not treated as a traffic sensitive part of the network.

Q. ARE THERE ANY OTHER PARTS OF THE "NETWORK" INCLUDED IN SPRINT PCS'S STUDY THAT MAKES THE STUDY UNRELIABLE AS A CALCULATOR OF THE TELRIC-BASED COST OF TERMINATING A BELLSOUTH-ORIGINATED CALL?

A. Yes. Sprint has included all of its towers and antenna in the cost study. Its argument is that these items are included in cost studies to determine the TELRIC-based cost of

switching. The conclusion we would reach is that such facilities are more akin to the telephone poles that are used to hold the wire that runs from the central office out to the wireline subscriber's premises. The poles aren't traffic sensitive and neither are the towers and antenna. These items are required for coverage and do not vary with the amount of traffic that Sprint PCS sends to its customers.

Q. IS THERE ANY OTHER EVIDENCE THAT SPRINT PCS HAS GROSSLY OVERSTATED ITS COSTS OF TERMINATING BELLSOUTH-ORIGINATED CALLS?

A. We believe there is. While we recognize that the appropriate standard to measure costs in this case is to use a TELRIC-based cost study, it is interesting to look at the incremental cost of a minute of traffic that traverses Sprint PCS's network. What we have done is to look at the increase in investment and expense between 2001 and 2002, as reported by Sprint PCS in its cost study and compared that to the growth in minutes of use over those same two years. Excluding costs that don't properly belong in the cost study, the year-over-year cost change is 0.2285 cents. [Exhibit 2]. Even including all of the costs incorporated in Sprint PCS's study, the year-over-year cost change is 0.7453 cents. [Exhibit 1].

Now Sprint PCS will no doubt argue that the reason that figure is so low is because the minutes of use are growing faster than the costs are growing. That of course, is exactly the point that we made above. Sprint PCS's "fill" factors have not stabilized. No one knows for sure what they will be. In these circumstances, Sprint PCS's cost study is an interesting exercise, but it cannot be said to truly reflect the TELRIC-

based cost of providing service.

Q. ISN'T THERE A POSSIBILITY THAT THE SPRINT PCS NETWORK NOW HAS REACHED ITS OPTIMAL CONFIGURATION?

A. Anything is possible, but that isn't likely here. Note, again, that the cost, by year, in Sprint's study is:

2000 9.3¢

2001 6.6¢

2002 5.0¢

With costs plummeting in that manner, there is no reason to believe that Sprint's network is optimally configured in 2002, much less 2000 or 2001.

As we noted earlier, each cell site has the capacity to have three channels over which calls can travel between the cell site and the mobile switching office. If you look at Sprint PSC's list of cell sites and the number of channels associated with each cell site, you see some with three channels, which suggests they may be at capacity, a few with two channels, and even more with only one channel. In fact, on a system-wide basis, in 2002 the network has 1,306 cell sites. Of those, 1,035 had only one carrier; 154 had two carriers and 117 had three carriers. For those cell sites with only one or two channels, clearly they have considerably more capacity than is actually needed at present and the cell site itself must have been established to meet coverage requirements.

Q. WHAT DO YOU MEAN BY COVERAGE REQUIREMENTS?

A. Coverage is the basic investment that Sprint PCS must make in order to provide seamless ubiquitous service to its own customers in each of its selected geographic service areas. Sprint PCS must also build-out its wireless network in a manner that provides for continuity of service throughout the area, *i.e.*, "cover" the territory. In other words, coverage is the basic wireless infrastructure needed to reach the boundaries of the service territory and is the counterpart to wireline subscriber access. Most of the basic infrastructure of a wireless network is designed to reach the boundaries of a selected coverage area. That is, there is a minimum access network infrastructure (a minimum number of BTS sites, a minimally adequate backhaul structure, minimum switching functionality and frequency spectrum) required to serve the wireless coverage area. The minimum number of BTS sites and the infrastructure to connect those sites to a central switch is determined by the assigned radio frequency, the terrain (including buildings) and antenna power limitations imposed on the carrier. Cell site coverage investment consists of both Base Station Controllers ("BSCs") and all of the 1st BTS radio carriers in each market (service) area. Investments for 2nd and 3rd BTS radio carriers are made to meet growth in demand. Sprint PCS's study is fundamentally flawed in that it contains a significant amount of investment to provide coverage (subscriber access), and fails to distinguish costs for increased traffic (usage). In rural and sparsely populated areas it is unlikely that such investments will need to be expanded over a very long time frame. Sprint PCS has made no effort to remove these coverage investments from its study.

Q. WELL, ISN'T IT POSSIBLE THAT SOME OF THE CELL SITES IN SPRINT PCS'S STUDY ARE AT THE CAPACITY THEY ARE EXPECTED TO ACHIEVE, BECAUSE OF THEIR LOCATION, PERHAPS AT THE FRINGE OF THE SERVICE AREA?

A. Yes, but that raises another point. You will recall that the reason that wireline carriers were not allowed to collect a reciprocal compensation charge for the use of the local loop was because that cost was determined to be fixed. If Sprint PCS builds a cell site on the margins of its service area where it determines that it will never use the full capacity of its cell site or the facilities that connect the cell site to the mobile serving office, that facility is in essence a "fixed" cost facility. That is, it costs a fixed amount to build the cell site and to connect it to the mobile telephone switching office, but there will never be sufficient usage to require any additional investment. In those circumstances, that particular cell site and connecting facilities are exactly like the wireline customer's local loop. The calls that are terminated using that facility simply do not increase the cost of maintaining that facility. Any such facilities should have been eliminated from Sprint PCS's cost study.

Q. IS THERE ANY ANECDOTAL EVIDENCE TO SUPPORT YOUR THEORY THAT SPRINT PCS'S STUDY IS FLAWED?

A. Yes. A review of retail pricing on Sprint PCS's web site indicates that one can buy minutes of use from Sprint at a cost of as little as 5 cents a minute. If one were to believe Sprint PCS's purported costs, the cost to Sprint PCS for a minute of use for a wireless-to-wireless call on their network would be in excess of 13.2 cents (6.6 cents

for both originating and terminating network costs plus retail costs.). This would result in a loss in excess of 8 cents for each minute of use, hardly a sound business practice. Even in the case of a wireless to wireline call, Sprint PCS would lose money on each minute. Again, again assuming their network costs are 6.6 cents, they would also incur retail costs and reciprocal compensation costs for transport and termination by the wireline carrier. This would result in a loss in excess of 2 cents for each minute, a loss that cannot be made up by increases in volume. In fact, if one were to believe Sprint PCS's position, increases in volume would only increase their losses. However, as evidenced by their own study, increases in volume actually reduce their unit cost which is precisely our position and the reason that Sprint PCS's study cannot be relied upon. Now it may be that Sprint PCS has determined that most people who buy those plans that generate a 5 cent-per-minute rate will not use all the minutes they are given, which has the effect of increasing those users' price per minute. But the point is, it wasn't too long ago when a minute of use cost the subscriber 35 or 39 cents a minute. The retail price of minutes of use has dropped significantly in a short period of time, leading to the inevitable conclusion that their underlying costs per minute of use must have decreased substantially.

Q. IN ADDITION TO THE PRACTICAL PROBLEMS DISCUSSED ABOVE, ARE THERE POLICY ISSUES THE COMMISSION SHOULD CONSIDER?

A. Yes. There are several such policy issues that should be considered by the Commission as it considers this case. First, if Sprint PCS's proposed rate were to be approved, it is highly likely that some form of wireline end user surcharge would have to be established to cover the enormous increase in cost. Since there is no

guarantee that the substantial increase in revenue to Sprint PCS will be passed on to its customers, Sprint PCS will enjoy a financial windfall at the expense of Florida's local rate payers. In essence, Sprint PCS's proposal shifts the costs of the wireless system beyond the switch to the wireline customer, costs that were incurred solely for the convenience of the customer who desires mobility.

Second, in theory, Sprint PCS could purchase sufficient amounts of spectrum, towers, antennas and backhaul so that mobile customers do not share these facilities - each is assigned what it needs, wherever they may be. We don't want to suggest that this is practical, because it is not. But if this were done, then there would be no issue about trying to charge BellSouth's wireline customers for these costs because they would not be traffic sensitive, even under Sprint PCS's theory. Now, just because Sprint PCS has found a way to make these services less expensive, it tries to transfer the responsibility for these costs from its mobile subscribers to BellSouth's wireline customers. Making it less expensive should not be the basis for transferring the cost responsibility. Fairness dictates that such costs should be borne by the customer that causes them, *i.e.* the mobile customer. If this is not the case, where do you stop?

Consider a customer utilizing a satellite phone in the far reaches of the Everglades. The logic of Sprint PCS's proposal would have the landline customer pay several dollars per minute to make the call to the satellite service customer, again paying for costs that are incurred solely for the convenience of the receiving customer. Clearly the wireless customer should be responsible for the cost of the facilities beyond the wireless switch, principally because the cost of such facilities was incurred to provide the mobile customer with the convenience of mobile service. This is consistent with

the FCC's decisions for both wireline and wireless carriers discussed more fully below.

REGULATORY REQUIREMENTS AND PRECEDENTS REGARDING RECIPROCAL COMPENSATION

Q. WHAT ARE THE REGULATORY REQUIREMENTS AND PRECEDENTS THAT THE COMMISSION SHOULD CONSIDER WHEN EVALUATING SPRINT PCS'S PROPOSAL?

A. Under Section 251(b) (5) of the Telecommunications Act of 1996 ("1996 Act"), Sprint PCS is entitled to receive reciprocal compensation for the transport and termination of telecommunications traffic that originates on BellSouth's wireline network. As discussed in detail later in this testimony we strongly believe that the regulatory requirements for reciprocal compensation are for Sprint PCS to be compensated for its traffic-sensitive incremental costs. We determined these costs based on the cost studies and data filed by Sprint PCS in this proceeding. This evaluation, based on regulatory requirements, results in a cost of $0.002836 per minute [Exhibit 2].

Q. IS THE REQUIREMENT FOR RECIPROCAL COMPENSATION AT ISSUE IN THIS PROCEEDING?

A. No. Both parties agree that reciprocal compensation is appropriate and in fact have had an interconnection agreement in place since 1997 that provided for symmetrical reciprocal compensation at a rate of $0.003776. The issue in the instant proceeding is

to determine if Sprint's proposed reciprocal compensation rate of $0.066 (a 1648% increase) is consistent with regulatory requirements, accurately reflects the additional costs that Sprint incurs for terminating BellSouth's land-to-mobile traffic and is in the public interest.

Q. HOW HAS THE FCC IMPLEMENTED THE REQUIREMENTS OF THE 1996 ACT REGARDING RECIPROCAL COMPENSATION?

A. In its Local Competition Order 96-325 in Docket 96-98, at paragraph 1039, the FCC defined transport as the transmission of terminating traffic from the interconnection point between the two carriers to the terminating carrier's end-office switch (or equivalent facility) that directly serves the called party. At paragraph 1040, the FCC defined termination as the switching of traffic at the terminating carrier's end-office switch (or equivalent facility) and delivery of that traffic from that switch to the called party's premises. At paragraph 1057, the FCC specifically excluded from the definition of "additional costs" those costs beyond the end-office switch that do not vary in proportion to the number of calls. For wireline networks this excludes costs associated with the local loop and the line port of the end-office switch. Similarly for wireless networks this would exclude all of the costs beyond the mobile switch.

It is important to note that for wireless carriers the FCC has certain build-out requirements that must be met by the licensee or the licensee will forfeit their license and will be ineligible to regain it. Investments made to meet the build-out requirements are not additional costs of termination but the initial fixed cost to be in the business. The FCC requires that licensees who hold 30 MHZ licenses construct

base stations that provide coverage to at least one-third of the population within five years and two-thirds of the population within ten years. For 10 MHZ licenses, coverage must be provided to at least one-quarter of the population within five years or there must be a showing of substantial service. Therefore, a significant portion of Sprint PCS's investments must be made just to meet the build-out requirements and to keep their license, regardless of the volume of traffic. No doubt that these build-out requirements contributed to the dramatic decrease in per minute costs reflected in Sprint PCS's study, as we discussed above. In no way should these costs be included in the computation of reciprocal compensation.

In addition, in order to market their service, Sprint PCS must have a seamless, ubiquitous network available to meet customer service requirements beyond those required to meet the minimal build out requirements. Since these costs for providing coverage do not vary in proportion to the volume of calls, they should also not be considered as additional costs for reciprocal compensation purposes.

Q. HAS THE FCC RECOGNIZED THAT THERE MAY BE DIFFERENCES BETWEEN INTERCONNECTING CARRIER NETWORKS?

A. Yes. The FCC recognizes these potential differences by incorporating the concept of "equivalent facilities", and encourages state commissions to:

> [C]onsider whether new technologies (e.g., fiber ring or wireless networks) perform functions similar to those performed by an incumbent ...

[FCC Order 96-325 at para. 1090].

Q. WHAT IS THE SIGNIFICANCE OF EQUIVALENT FACILITIES?

A. Since the FCC recognized that all networks might not be the same; its guidance with regard to equivalent facilities can be applied by comparing the operating characteristics of the components of wireline and wireless networks, in order to determine the appropriate costs to be considered as additional costs for reciprocal compensation purposes

Q. HAVE THERE BEEN ANY REGULATORY DECISIONS SINCE THE FCC'S ORIGINAL LOCAL COMPETITION ORDER THAT ADDRESS RECIPROCAL COMPENSATION FOR LAND TO MOBILE CALLS AND THE ISSUE OF EQUIVALENT FACILITIES?

A. Yes, we are aware of several decisions, most notably from the FCC itself, as well as from this Commission, and commissions in Montana and California. Regulatory decisions from the FCC, as well as the states of Montana and California support the proposition that the rate for reciprocal compensation for a wireless company should be determined based on the traffic sensitive costs of the mobile switch. Specifically:

- FCC Order 00-194[12] states that the mobile switch is the functional equivalent of the LEC end-office switch and, therefore, the FCC determined that

[12] In the Matters of TSR Wireless, LLC, *et al.*, v. U S West Communications, Inc., *et al.*, File Nos. E-98-13, E-98-15,E-98-16, E-98-17, E-98-18 (FCC rel. June 21, 2000).

reciprocal compensation includes only the additional costs incurred up to the mobile switch.

- Docket No. D96.9.150 in Montana (Western Wireless Corporation's Petition for Arbitration with U S West) also supports the position that the mobile switch is the only component that should be considered for inclusion as an additional cost for reciprocal compensation purposes.
- Application No. 97-02-003 in California (Application of Cook Telecom for Arbitration) fully supports the position that costs beyond the mobile switch should not be considered for recovery through reciprocal compensation.

This Commission also addressed some of these issues in Docket No. 971194-TP (Petition for Wireless One for Arbitration with Sprint-Florida). The Commission did not find that all costs beyond the mobile switch were appropriate for reciprocal compensation. It did find that tandem interconnection rates were appropriate for reciprocal compensation and maintained symmetrical compensation rates. Applying that principle in this proceeding would result in the BellSouth proposed reciprocal compensation rate of $0.003776 per minute.

Q. GIVEN THAT THE FCC HAS DETERMINED THAT COSTS FOR RECIPROCAL COMPENSATION DO NOT INCLUDE COSTS BEYOND THE END-OFFICE FOR LECs, HOW CAN THIS BE APPLIED TO WIRELESS NETWORKS?

A. By comparing the functionality of wireline and wireless networks one can determine the particular components of the wireless network that should be included in reciprocal compensation, consistent with FCC rulings.

There are two fundamental components of a PCS network that support functions identical to those of the components of a wireline network. The fundamental components are: the Mobile Telephone Exchange ("MTX") end-office, referred to as the switch subsystem, which provides functions equivalent to the wireline end-office, and the Radio Subsystem which provides functions equivalent to loop plant in the wireline network.

Q. CAN EITHER THE RADIO SUBSYSTEM IN THE WIRELESS NETWORK OR THE DIGITAL LOOP CARRIER SYSTEMS IN THE WIRELINE NETWORK COMPLETE CALLS ON A STAND-ALONE BASIS?

A. No. Neither the radio subsystem in the wireless network nor the digital loop carrier systems in the wireline network have the ability to process either an originating call or a terminating call without the end-office switch. Neither has stand-alone call processing capabilities. In the event that the links between the MTX and the Base Station Controller ("BSC") are severed, handsets in the area covered by the BTSs associated with that BSC would not be able to either originate or terminate a call. Similarly, if either the facilities between the wireline end-office switch and the central office terminal ("COT") and/or the fiber optic terminal ("FOT") are severed, a subscriber served by the remote terminal ("RT") associated with it would also not be able to originate nor terminate a call.

Q. IS THE BASE STATION CONTROLLER ("BSC") PART OF THE SWITCH?

A. No. We have reviewed the appropriate literature, specifically Nortel document

50188.02, and the Base Station Controller is part of the Radio Subsystem and is only collocated with the MTX. The actual interface of the BSC to the switch, for control messages, is through interface peripherals (*i.e.*, the CDMA Interface Unit and the CDMA Application Unit) in the MTX. Customer access to the Radio Subsystem is over digital trunks between the Digital Trunk Controllers in the MTX and the BSC in the Radio Subsystem.

Q. HAS SPRINT PCS CORRECTLY APPLIED THE RULES AND REGULATIONS REGARDING RECIPROCAL COMPENSATION?

A. No. The various regulatory decisions and network comparisons discussed above can lead to no other conclusion than that additional costs for reciprocal compensation stop at the end-office switch, and the mobile switching office is equivalent to the end-office. Therefore, Sprint PCS has inappropriately included costs for the BSC, BTS, towers, backhaul, spectrum and spectrum clearing in its cost study.

Q. HASN'T THE COMMISSION ALREADY DECIDED THAT THE CELL SITE IS THE EQUIVALENT OF THE END OFFICE, NOT THE MOBILE TELEPHONE OFFICE?

A. We understand from reading the Commission's decision in 1998 that it appears to have reached that result. We respectfully disagree with that conclusion and would urge the Commission to reconsider its position, since it is fairly clear that there are no circumstances under which a cell site by itself could actually function as an end office.

Q. BASED ON THE SPRINT PCS STUDY, CAN YOU QUANTIFY THE COMPENSATION THAT SPRINT PCS SHOULD BE ENTITLED TO FOR TERMINATING BELLSOUTH-ORIGINATED TRAFFIC?

A. In the absence of a properly conducted cost study, it is difficult to estimate what that cost ought to be. However, we have quantified the traffic-sensitive costs based on Sprint PCS's data for the year 2002, which represents the mid-point of a three year period from 2001 through 2003. This results in a cost per minute of $0.002836. [Exhibit 2]. This cost is consistent with regulatory requirements and precedents.

In addition, we have attempted to provide the Commission additional guidance regarding the reasonableness of Sprint PCS's proposed $0.066 per minute rate by determining a reasonableness check based on a rate derived by quantifying the change in costs in subsequent years as a measure of the additional costs of the system. To do this analysis we quantified the change in Sprint PCS's cost from 2001-2002 divided by the change in demand from 2001-2002. This analysis results in a rate of $0.002285 per minute. [Exhibit 2]. This is fairly consistent with the rate of $0.002836 derived above. We do not believe that this is the most accurate method for determining the additional costs caused by BellSouth's traffic as this analysis has certain deficiencies both pro and con, such as the inclusion of fixed costs that are required to meet build-out requirements and to provide geographical coverage to Sprint PCS's customers. However, in the absence of specific responses from Sprint PCS, it provides some guidance as to the reasonableness of the proposed reciprocal

compensation rate. It clearly shows just how unreasonable Sprint PCS's proposed $0.066 rate is.

Q. WHAT CONCLUSION DO YOU REACH FROM YOUR ANALYSIS?

A. We think that the Commission has to reach the conclusion that Sprint PCS's cost study has to be inaccurate and flawed. The study cannot be relied upon to establish asymmetrical reciprocal compensation rates. The results that it produces defy logic, are demonstrably overstated and cannot represent the cost of a telecommunications firm that is using the lowest cost network configuration. If the network configuration were the lowest cost, then the cost couldn't be dropping from year to year. Sprint PCS's proposal is contrary to the public interest and should be rejected by the Commission.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

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Sprint PCS - Cost per MOU by Year

REDACTED

	Cost 2000	Cost 2001	Cost 2002	MOU 2000	MOU 2001	MOU 2002	Cost/MOU '00	Cost/MOU '01	Cost/MOU '02	
1. MTX (Mobile Telephone Exchange) Investment										(1)
2. 1 + % MOU Requiring Multiple MTXs **										(2)
3. MTX Cost										(3)
4. BSC (Base Station Controller) Investment										(4)
5. MSC (MOBILE SWITCHING CENTER)										(5)
6. BACKHAUL										(6)
7. BTS (BASESTATION TRANSCEIVER SYSTEM)										(7)
8. ANTENNAE										(8)
9. STRUCTURE										(9)
10. COMMON COST @ 16.67%										(10)
11. TOTAL ECONOMIC COST PER MOU										(11)
12. SPECTRUM LICENSES and SPECTRUM CLEARING										(12)
13. COMMON COST on Spectrum Licenses & Clearing @ 16.67%										(13)
14. GRAND TOTAL ECONOMIC COST PER MOU							$ 0.092977	$ 0.065777	$ 0.050216	(14)

Sprint PCS - Change in Cost / Change in MOU

	2002 less 2000	2001 less 2000	2002 less 2001	2002 less 2000	2001 less 2000	2002 less 2001	2002 less 2000	2001 less 2000	2002 less 2001
15. MTX (Mobile Telephone Exchange) Investment									
16. 1 + % MOU Requiring Multiple MTXs **									
17. MTX Cost									
18. BSC (Base Station Controller) Investment									
19. MSC (MOBILE SWITCHING CENTER)									
20. BACKHAUL									
21. BTS (BASESTATION TRANSCEIVER SYSTEM)									
22. ANTENNAE									
23. STRUCTURE									
24. COMMON COST @ 16.67%									
25. TOTAL ECONOMIC COST PER MOU									
26. SPECTRUM LICENSES and SPECTRUM CLEARING									
27. COMMON COST on Spectrum Licenses & Clearing @ 16.67%									
28. GRAND TOTAL ECONOMIC COST PER MOU							$ 0.013530	$ 0.019504	$ 0.007453

References to lines in Sprint PCS's filing, Bates-stamped pages 242-243:

(1) Lines 24, 27 & 30.
(2) L. 31.
(3) L. 32.
(4) Lines 37, 41 and 44.
(5) L. 46.
(6) Lines 49, 52 and 55.
(7) Lines 61, 65 & 68.
(8) Lines 74, 78 & 81.
(9) Lines 92, 96 & 98.
(10) L. 101.
(11) L. 102.
(12) Lines 108 + 121, 126 & 115 + 128.
(13) L. 132 - L.130.
(14) L. 134.

Sprint PCS - Florida
Calculation Module
Economic Cost Development Worksheet

REDACTED

Row #	Description	Worksheet Source	2000	2001	2002	Total	
8	**MSC (MOBILE SWITCHING CENTER)**						
9	**MTX (Mobile Telephone Exchange) Investment**						
10	Average Investment	Inv. Sum.					
11	TELRIC ACF	Input \ ACF					
12	Investment Related Annual Expense						
13							
14	**National Platform Investment***						
15	Average Investment	Inv. Sum.					
16	TELRIC ACF	Input \ ACF					
17	Investment Related Annual Expense						
18							
19	**Total Inv. Related Annual Expense**						L.12 + L.17
20							
21	**Other MTX Expenses**						
22	SS7 Expenses	SS7					
23							
24	**Total MTX Expenses**						L.19 + L.22
25	Discounted MTX Expenses						
26							
27	**MTX MOU**	Input \ Demand					
28	Discounted MOU						
29							
30	**MTX Cost Per MOU**						L.24 / L.27
31	**% MOU Requiring Multiple MTXs ** **	Input \ Demand					
32	**MTX Cost Per MOU**						L.30 x (1 + L.31)
33							
34	**BSC (Base Station Controller) Investment**						
35	Average Investment	Inv. Sum.					
36	TELRIC ACF	Input \ ACF					
37	Investment Related Annual Expense						
38							
39	Discounted BSC Expenses						
40							
41	**BSC MOU**	Input \ Demand					
42	Discounted MOU						
43							
44	**BSC Cost Per MOU**						L.39 / L.42
45							
46	**MSC Cost Per MOU**						L.32 + L.44
47							
48	**BACKHAUL**						
49	**Backhaul Expenses**	Backhaul					
50	Discounted Backhaul Expenses						
51							
52	**Backhaul MOU**	Input \ Demand					
53	Discounted MOU						
54							
55	**Backhaul Cost Per MOU**						L.50 / L.53
56							
57	**BTS (BASESTATION TRANSCEIVER SYSTEM)**						
58	**BTS Investment**						
59	Average Investment	Inv. Sum.					
60	TELRIC ACF	Input \ ACF					
61	Investment Related Annual Expense						
62							
63	Discounted BTS Expenses						
64							
65	**BTS MOU**	Input \ Demand					
66	Discounted MOU						
67							
68	**BTS Cost Per MOU**						L.63 / L.66
69							

REDACTED

Row #	Description	Worksheet Source	2000	2001	2002	Total	
70	**ANTENNAE**						
71	**Antennae Investment**						
72	Average Investment	Inv. Sum.					
73	TELRIC ACF	Input \ ACF					
74	Investment Related Annual Expense						
75							
76	Discounted BTS Expenses						
77							
78	**Antennae MOU**	Input \ Demand					
79	Discounted MOU						
80							
81	**Antennae Cost Per MOU**						L.76 / L.79
82							
83	**STRUCTURE**						
84	**Structure Investment**						
85	Average Investment	Inv. Sum.					
86	TELRIC ACF	Input \ ACF					
87	Investment Related Annual Expense						
88							
89	**Other Structure Expenses**						
90	Collocation Expenses	Collocation					
91							
92	**Total Structure Expenses**						L.87 + L.90
93	Discounted Structure Expenses						
94							
95	**Structure MOU**	Input \ Demand					
96	Discounted MOU						
97							
98	**Structure Cost Per MOU**						L.93 / L.96
99							
100	**TOTAL TELRIC PER MOU**						L.46 + L.55 + L.66 + L.81 + L.99
101	Common Cost						
102	**TOTAL ECONOMIC COST PER MOU**						L.100 x (1 + L.101)
103							
104	**SPECTRUM LICENSES**						
105	**Spectrum Licenses Investment**						
106	Average Investment	Inv. Sum.					
107	TELRIC ACF	Input \ ACF					
108	Investment Related Annual Expense						
109							
110	Discounted Spectrum Licenses Expenses						
111							
112	**Spectrum Licenses MOU**	Input \ Demand					
113	Discounted MOU						
114							
115	**Spectrum Licenses Cost Per MOU**						L.110 / L.113
116							
117	**SPECTRUM CLEARING**						
118	**Spectrum Clearing Investment**						
119	Average Investment	Inv. Sum.					
120	TELRIC ACF	Input \ ACF					
121	Investment Related Annual Expense						
122							
123	Discounted Spectrum Clearing Expenses						
124							
125	**Spectrum Clearing MOU**	Input \ Demand					
126	Discounted MOU						
127							
128	**Spectrum Clearing Cost Per MOU**						L.123 / L.126
129							
130	**TOTAL SPECTRUM LICENSES TELRIC PER MOU**						L.115 + L.128
131	Common Cost						
132	**TOTAL SPECTRUM LICENSES ECONOMIC COST PER MOU**						L.130 x (1 + L.131)
133							
134	**GRAND TOTAL TELRIC PER MOU**		$ 0.092977	$ 0.085777	$ 0.080216	$ 0.086184	L.102 + L.132
135							
136							
137	Discount Factor at	14.61%	0.93267	0.81183	0.70649		
138	Period		0.50	1.50	2.50		
139							
140	* HLR / SCP						
141	** Represents the percent of completed calls which are routed through two MTXs.						

Sprint PCS - Cost per MOU by Year

REDACTED

	Cost 2000	Cost 2001	Cost 2002	MOU 2000	MOU 2001	MOU 2002	Cost/MOU '00	Cost/MOU '01	Cost/MOU '02	
1. MTX (Mobile Telephone Exchange) Investment										(1)
2. 1 + % MOU Requiring Multiple MTXs **										(2)
3. MTX Cost										(3)
4. BSC (Base Station Controller) Investment										(4)
5. MSC (MOBILE SWITCHING CENTER)										(5)
6. BACKHAUL										(6)
7. BTS (BASESTATION TRANSCEIVER SYSTEM)										(7)
8. ANTENNAE										(8)
9. STRUCTURE										(9)
10. COMMON COST @ 16.67%										(10)
11. TOTAL ECONOMIC COST PER MOU										(11)
12. SPECTRUM LICENSES and SPECTRUM CLEARING										(12)
13. COMMON COST on Spectrum Licenses & Clearing @ 16.67%										(13)
14. GRAND TOTAL ECONOMIC COST PER MOU							$ 0.003589	$ 0.003033	$ 0.002836	(14)

Sprint PCS - Change in Cost / Change in MOU

	2002 less 2000	2001 less 2000	2002 less 2001	2002 less 2000	2001 less 2000	2002 less 2001	2002 less 2000	2001 less 2000	2002 less 2001
16. MTX (Mobile Telephone Exchange) Investment									
18. 1 + % MOU Requiring Multiple MTXs **									
17. MTX Cost									
18. BSC (Base Station Controller) Investment									
19. MSC (MOBILE SWITCHING CENTER)									
20. BACKHAUL									
21. BTS (BASESTATION TRANSCEIVER SYSTEM)									
22. ANTENNAE									
23. STRUCTURE									
24. COMMON COST @ 16.67%									
25. TOTAL ECONOMIC COST PER MOU									
26. SPECTRUM LICENSES and SPECTRUM CLEARING									
27. COMMON COST on Spectrum Licenses & Clearing @ 16.67%									
28. GRAND TOTAL ECONOMIC COST PER MOU							$ 0.002168	$ 0.002054	$ 0.002285

References to lines in Sprint PCS's filing, Bates-stamped pages 242-243:

(1) Lines 24, 27 & 30.
(2) L. 31.
(3) L. 32.
(4) Lines 37, 41 and 44.
(5) L. 46.
(6) Lines 49, 52 and 55.
(7) Lines 61, 65 & 68.
(8) Lines 74, 78 & 81.
(9) Lines 92, 95 & 98.
(10) L. 101.
(11) L. 102.
(12) Lines 108 + 121, 125 & 115 + 128.
(13) L. 132 - L.130.
(14) L. 134.

Sprint PCS - Florida
Calculation Module
Economic Cost Development Worksheet

REDACTED

Row #	Description	Worksheet Source	2000	2001	2002	Total	
8	**MSC (MOBILE SWITCHING CENTER)**						
9	**MTX (Mobile Telephone Exchange) Investment**						
10	Average Investment	Inv. Sum.					
11	TELRIC ACF	Input \ ACF					
12	Investment Related Annual Expense						
13							
14	**National Platform Investment***						
15	Average Investment	Inv. Sum.					
16	TELRIC ACF	Input \ ACF					
17	Investment Related Annual Expense						
18							
19	**Total Inv. Related Annual Expense**						L.12 + L.17
20							
21	**Other MTX Expenses**						
22	SS7 Expenses	SS7					
23							
24	**Total MTX Expenses**						L.19 + L.22
25	Discounted MTX Expenses						
26							
27	**MTX MOU**	Input \ Demand					
28	Discounted MOU						
29							
30	**MTX Cost Per MOU**						L.24 / L.27
31	% MOU Requiring Multiple MTXs **	Input \ Demand					
32	**MTX Cost Per MOU**						L.30 x (1 + L.31)
33							
34	**BSC (Base Station Controller) Investment**						
35	Average Investment	Inv. Sum.					
36	TELRIC ACF	Input \ ACF					
37	Investment Related Annual Expense						
38							
39	Discounted BSC Expenses						
40							
41	**BSC MOU**	Input \ Demand					
42	Discounted MOU						
43							
44	**BSC Cost Per MOU**						L.39 / L.42
45							
46	**MSC Cost Per MOU**						L.32 + L.44
47							
48	**BACKHAUL**						
49	**Backhaul Expenses**	Backhaul					
50	Discounted Backhaul Expenses						
51							
52	**Backhaul MOU**	Input \ Demand					
53	Discounted MOU						
54							
55	**Backhaul Cost Per MOU**						L.50 / L.53
56							
57	**BTS (BASESTATION TRANSCEIVER SYSTEM)**						
58	**BTS Investment**						
59	Average Investment	Inv. Sum.					
60	TELRIC ACF	Input \ ACF					
61	Investment Related Annual Expense						
62							
63	Discounted BTS Expenses						
64							
65	**BTS MOU**	Input \ Demand					
66	Discounted MOU						
67							
68	**BTS Cost Per MOU**						L.63 / L.66
69							

REDACTED

Row #	Description	Worksheet Source	2000	2001	2002	Total	
70	**ANTENNAE**						
71	**Antennae Investment**						
72	Average Investment	Inv. Sum.					
73	TELRIC ACF	Input \ ACF					
74	Investment Related Annual Expense						
75							
76	Discounted BTS Expenses						
77							
78	**Antennae MOU**	Input \ Demand					
79	Discounted MOU						
80							
81	**Antennae Cost Per MOU**						L.76 / L.79
82							
83	**STRUCTURE**						
84	**Structure Investment**						
85	Average Investment	Inv. Sum.					
86	TELRIC ACF	Input \ ACF					
87	Investment Related Annual Expense						
88							
89	**Other Structure Expenses**						
90	Collocation Expenses	Collocation					
91							
92	**Total Structure Expenses**						L.87 + L.90
93	Discounted Structure Expenses						
94							
95	**Structure MOU**	Input \ Demand					
96	Discounted MOU						
97							
98	**Structure Cost Per MOU**						L.93 / L.96
99							
100	**TOTAL TELRIC PER MOU**						L.48 + L.55 + L.68 + L.81 + L.99
101	Common Cost						
102	**TOTAL ECONOMIC COST PER MOU**						L.100 x (1 + L.101)
103							
104	**SPECTRUM LICENSES**						
105	**Spectrum Licenses Investment**						
106	Average Investment	Inv. Sum.					
107	TELRIC ACF	Input \ ACF					
108	Investment Related Annual Expense						
109							
110	Discounted Spectrum Licenses Expenses						
111							
112	**Spectrum Licenses MOU**	Input \ Demand					
113	Discounted MOU						
114							
115	**Spectrum Licenses Cost Per MOU**						L.110 / L.113
116							
117	**SPECTRUM CLEARING**						
118	**Spectrum Clearing Investment**						
119	Average Investment	Inv. Sum.					
120	TELRIC ACF	Input \ ACF					
121	Investment Related Annual Expense						
122							
123	Discounted Spectrum Clearing Expenses						
124							
125	**Spectrum Clearing MOU**	Input \ Demand					
126	Discounted MOU						
127							
128	**Spectrum Clearing Cost Per MOU**						L.123 / L.126
129							
130	**TOTAL SPECTRUM LICENSES TELRIC PER MOU**						L.115 + L.128
131	Common Cost						
132	**TOTAL SPECTRUM LICENSES ECONOMIC COST PER MOU**						L.130 x (1 + L.131)
133							
134	**GRAND TOTAL TELRIC PER MOU**		[redacted]	[redacted]	[redacted]	[redacted]	L.102 + L.132
135							
136							
137	**Discount Factor at**	14.91%	0.93287	0.81193	0.70649		
138	Period		0.50	1.50	2.50		
139							
140	* HLR / SCP						
141	** Represents the percent of completed calls which are routed through two MTXs.						

Sprint PCS - Florida
Input Module
Unit Input Worksheet (Cumulative)

Exhibit 2
Pages 4 & 5

Row #	Description	Miami (Dade 1) Base	Miami (Dade 1) 2000	Miami (Dade 1) 2001	Miami (Dade 1) 2002	Miami (Dade 2) Base	Miami (Dade 2) 2000	Miami (Dade 2) 2001	Miami (Dade 2) 2002	Deerfield Beach Base	Deerfield Beach 2000	Deerfield Beach 2001	Deerfield Beach 2002	Jacksonville 1 Base	Jacksonville 1 2000	Jacksonville 1 2001	Jacksonville 1 2002	Orlando 1 Base	Orlando 1 2000	Orlando 1 2001	Orlando 1 2002	Orlando 2 Base	Orlando 2 2000	Orlando 2 2001	Orlando 2 2002	Tampa Base	Tampa 2000	Tampa 2001	Tampa 2002
8																													
9	[redacted]																												
10																													
11																													
12																													
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31																													
32																													
33																													
34																													
35																													
36																													
37	(BSC) #1 Base Station Controller																												
38																													
39																													
40																													
41																													
42																													
43																													
44																													
45																													
46																													
47																													
48																													
49	(BTS) 1st Carrier Initial - Base Station Transceiver																												
50																													
51																													
52																													
53																													
54																													
55																													
56																													
57																													
58																													
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61																													
62																													
63																													
64																													
65																													
66																													
67																													
68																													
69	(BTS) 2nd Carrier - Base Station Transceiver (Add):																												
70																													
71																													
72																													
73																													
74																													

REDACTED

Sprint PCS - Florida
Input Module
Unit Input Worksheet (Cumulative)

A	B	D	E	F	G	I	J	K	L	N	O	P	Q	S	T	U	V	X	Y	Z	AA	AC	AD	AE	AF	AH	AI	AJ	AK
		Miami (Dade 1)				Miami (Dade 2)				Deerfield Beach				Jacksonville 1				Orlando 1				Orlando 2				Tampa			
Row #	Description	Base	2000	2001	2002	Base	2000	2001	2002	Base	2000	2001	2002	Base	2000	2001	2002	Base	2000	2001	2002	Base	2000	2001	2002	Base	2000	2001	2002
75	(BTS) 3rd Carrier - Base Station Transceiver (Add)																												
76																													
77																													
78																													
79																													
80	(BSC) #2 Base Station Controller																												
81																													
82																													
83																													
84																													
85																													
86																													
87																													
88																													
89																													
90																													
91																													
92	(BTS) 1st Carrier Initial - Base Station Transceiver																												
93																													
94																													
95																													
96																													
97																													
98																													
99																													
100																													
101																													
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103																													
104																													
105																													
106																													
107																													
108																													
109																													
110	(BTS) 2nd Carrier - Base Station Transceiver (Add)																												
111																													
112																													
113																													
114																													
115																													
116	(BTS) 3rd Carrier - Base Station Transceiver (Add)																												
117																													
118																													
119																													
120																													
121	[illegible]																												
122																													
123																													
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138																													
139																													
140																													

Notes:
All cell inputs are cumulative.
Do not enter "0" (zero); rather leave cell blank.

REDACTED

EXHIBIT A

STATEMENT OF QUALIFICATIONS

JAMSHED K. MADAN
PRINCIPAL,
GEORGETOWN CONSULTING GROUP, INC.

EXHIBIT A

Statement of Qualifications

Jamshed K. Madan
Principal, Georgetown Consulting Group, Inc.

Education

M.S. in Management, 1968, Alfred P. Sloan School of Management, Massachusetts Institute of Technology

B.S. in Electrical Engineering, 1966, Massachusetts Institute of Technology

Employment

May 1979 to present	Principal, Georgetown Consulting Group, Inc.
May 1976 to April 1979	Principal and National Director of Regulatory Consulting, Touche Ross & Company
September 1975 to April 1976	General Manager, Corporate Development, Public Service Electric & Gas
August 1968 to August 1975	Touche Ross & Company

Utility Regulatory Experience

Mr. Madan has provided expert testimony in over 150 proceedings, covering various utility regulatory matters, in cases involving telecommunications, electric, gas, water, sewer and transit utilities. The jurisdictions in which Mr. Madan has appeared include: Alabama, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Guam, Guyana SA, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, New Mexico, New York, Ohio, Pennsylvania, U.S. NRC, U.S. Virgin Islands, Virginia. A list of the proceedings in which Mr. Madan has testified and/or filed testimony is attached. In addition to participation in those regulatory proceedings, Mr. Madan has lead projects that included operations reviews, financial feasibility studies, economic studies, marketing studies, cash flow analyses, cost reduction studies and system planning studies.

Regulatory Participation of
Jamshed K. Madan
(Through September, 2000)

1. New Jersey, Hackensack Water Company, Docket No. 744-315, August, 1974.

2. New Jersey, Elizabethtown Gas Company, Docket No. 727-624.

3. U.S. Virgin Islands, Manassah Bus Lines, Docket No. 150.

4. New Jersey, Elizabethtown Water Company, Docket No. 727-606.

5. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 193.

6. New Jersey, Jersey Central Power & Light Company, Docket No. 743-184, October, 1974.

7. Vermont, New England Telephone and Telegraph Company, Docket No. 3806, November, 1974.

8. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 254.

9. New Jersey, New Jersey Bell Telephone Company, Docket No. 747-522, April, 1975.

10. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 121, September, 1975.

11. New Jersey, New Jersey Bell Telephone Company, Docket No. 7512-1251, May, 1976.

12. Pennsylvania, Philadelphia Electric Company, R.I.D. No. 295, June, 1976.

13. Maryland, Baltimore Gas & Electric Company, Case No. 6985, October, 1976.

14. New Jersey, Atlantic City Electric Company, Docket Nos. 706-641 and 772-113, April, 1977.

15. Pennsylvania, Bell Telephone Company of Pennsylvania, Docket No. 367, July, 1977.

16. Pennsylvania, Pennsylvania Electric Company, R.I.D. No. 392, August, 1977.

17. Connecticut, Southern New England Telephone Company, Docket No. 770526, October, 1977.

18. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 126, November, 1977.

19. Pennsylvania, Metropolitan Edison Company, R.I.D. No. 434, November, 1977.

20. New Jersey, New Jersey Bell Telephone Company, Docket No. 7711-1136, July, 1978.

21. Pennsylvania, Pennsylvania Electric Company, R.I.D. No. 599, September, 1978.

22. New York, Long Island Lighting Company, Case Nos. 27374 and 27375, October, 1978.

23. Pennsylvania, Metropolitan Edison Company, R.I.D. No. 626, November, 1978.

24. New Jersey, Jersey Central Power & Light Company, Docket No. 7610-1021, December, 1978.

25. Ohio, Columbus and Southern Ohio Electric Company, Docket No. 78-1439-EL-AEM, January, 1979.

26. New York, New York Telephone Company, Case No. 27469, May, 1979.

27. New Mexico, Mountain Bell Telephone Company, Docket No. , September, 1979.

28. New Jersey, Public Service Electric & Gas Company, Docket No. 794-310, October, 1979.

29. Maryland, Potomac Electric Company, Case No. 7384, February, 1980.

30. Delaware, Delmarva Power & Light Company, Docket No. 41-79, March, 1980.

31. Colorado, Mountain States Bell Telephone Company, Docket No. 1400, April, 1980.

32. Delaware, Delmarva Power & Light Company, Complaint Docket No. 279-80, June, 1980.

33. New York, New York Telephone Company, Case No. 27100, July, 1980.

34. New Jersey, New Jersey Bell Telephone Company, Docket No. 802-135, July, 1980.

35. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 108, August, 1980.

36. Connecticut, Southern New England Telephone Company, Docket No. 800418, August, 1980.

37. Ohio, Ohio Bell Telephone Company, Case No. 79-1184-TP-AIR, September, 1980.

38. Maryland, Delmarva Power & Light Company, Case No. 7427, September, 1980.

39. Maryland, C&P Telephone Company, Case No. 7467, October, 1980.

40. Colorado, Public Service Company of Colorado, Docket No. 1425, October, 1980.

41. Alabama, Continental Telephone Company of the South, Docket No. 17968, November, 1980.

42. New York, Long Island Lighting Company, Case No. 27774, November, 1980.

43. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 180, November, 1980.

44. Delaware, Delmarva Power & Light Company, Docket No. 80-39, December, 1980.

45. Alabama, South Central Bell, Case Nos. 10875 & 10876, June 1981.

46. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 229, June 1981.

47. Minnesota, Northwestern Bell Telephone Company, Docket No. P-421/GR80-911, June, 1981.

48. Delaware, Delmarva Power & Light Company, Docket No. 81-23, July, 1981.

49. Colorado, Public Service Company of Colorado, Docket No. 1525, September, 1981.

50. New Jersey, Public Service Electric & Gas Company, Docket No. 812-76, September, 1981.

51. New Jersey, New Jersey Bell Telephone Company, Docket No. 815-458, December, 1981.

52. Ohio, Cleveland Electric Illuminating Company, Case No. 81-146-EL-AIR, December, 1981.

53. Maryland, C&P Telephone Company, Case No. 7591, December, 1981.

54. Massachusetts, Boston Edison Company, Docket No. DPU-906, January, 1982.

55. Pennsylvania, Bell Telephone Company of Pennsylvania, Docket No. R-811819, May, 1982.

56. Colorado, Mountain States Bell Telephone Company, Docket No. 1575, September, 1982.

57. Maryland, C&P Telephone Company, Case No. 7661, November, 1982.

58. Delaware, Diamond State Telephone Company, Docket No. 82-32, February, 1983.

59. New York, Long Island Lighting Company, Case No. 28252, February, 1983.

60. New Jersey, Public Service Electric & Gas Company, Docket No. 831-25, February, 1983.

61. Georgia, Southern Bell Telephone Company, Docket No. 3393-U, June, 1983.

62. New Jersey, New Jersey Bell Telephone Company, Docket Nos. 8211-1030 and 8210-880 Phase II, November, 1983.

63. Arkansas, Southwestern Bell Telephone Company, Docket No. 83-045-U, September, 1983.

64. New Jersey, New Jersey Bell Telephone Company, Docket No. 8311-954, February, 1984.

65. Colorado, Public Service Company of Colorado, Docket No. 1640, February, 1984.

66. U.S. Nuclear Regulatory Commission, Long Island Lighting Company, Low Power Proceeding, Docket No. 50-322-OL-4, 1984.

67. Colorado, Mountain States Bell Telephone Company, Docket No. 1655, April, 1984.

68. Georgia, Southern Bell Telephone Company, Docket No. 3465-U, August, 1984.

69. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 275, November, 1984.

70. New Jersey, New Jersey Bell Telephone Company, Docket No. 848-856, December,

1984.

71. New Jersey, Public Service Electric & Gas Company, Docket No. 837-620, April, 1985.

72. New Jersey, AT&T Communications of New Jersey, Docket Nos. 8311-1035 and 8311-1064, May, 1985.

73. Maryland, C&P Telephone Company, Case No. 7851, April, 1985.

74. Arkansas, Arkansas Power & Light Company, Docket No. 84-249-U, June, 1985.

75. Georgia, Southern Bell Telephone Company, Docket No. 3518-U, July, 1985.

76. Colorado, Mountain States Bell Telephone Company, Docket No. 1700, March, 1986.

77. New Jersey, Public Service Electric & Gas Company, Docket No. 8512-1163, May, 1986.

78. Maryland, C&P Telephone Company Generic Case - EA/NR, Case No. 7901, April, 1986.

79. Delaware, Diamond State Telephone Company, Docket No. 86-20, September, 1986.

80. Colorado, Mountain States Telephone and Telegraph Company, Application 37730, September, 1986.

81. New Jersey, Public Service Electric and Gas Company, BPU Docket No. ER85121163, November, 1986.

82. Delaware, Diamond State Telephone Company, Regulation Docket No. 10, January, 1987.

83. Georgia, Georgia Power Company, Docket No. 3549-U, March, 1987.

84. Delaware, Diamond State Telephone Company, Docket No. 86-20, April, 1987.

85. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 301, April, 1987.

86. New Jersey, New Jersey Bell Telephone Company, Docket No. TO8610-1115, April, 1987.

87. Georgia, Georgia Power Company, Docket No. 3673-U, August, 1987.

88. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 277, September, 1987.

89. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 314, October, 1987.

90. New Jersey, AT&T Communications of New Jersey, Docket No. TR8704-361, November, 1987.

91. New Jersey, Public Service Electric & Gas Company - Gas Operations, Docket No. ER8512-1163, February, 1988.

92. New Jersey, Public Service Electric & Gas Company - Electric Operations, Docket No. ER8512-1163, February, 1988.

93. New Jersey, New Jersey Bell Telephone Company, Docket No. T-87050398, March, 1988.

94. New Jersey, Peach Bottom, Docket No. ER8802-0324, Oral Testimony, March, 1988.

95. District of Columbia, District of Columbia Natural Gas Company, Formal Case No. 870, May, 1988.

96. Delaware, Diamond State Telephone Company, Docket No. 86-20, Phase II, June, 1988

97. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 316, June, 1988.

98. Guam, Guam Power Authority, Docket No. 88-001, July, 1988.

99. New Mexico, Public Service Company of New Mexico, Case No. 2146, October, 1988.

100. California, In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers, Case No. I.87-11-033, January 1989.

101. California, In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers, Case No. A.88-08-031, April, 1989.

102. Guam, Guam Power Authority, Docket No. 88-002, May 1989.

103. Colorado, Mountain States Telephone & Telegraph Company, I&S Docket No. 1400, May, 1989.

104. New Jersey, Public Service Electric & Gas Company, Docket No. ER85121163, May, 1989.

105. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 322, August, 1989.

106. Georgia, Georgia Power Company, Docket No. 3840-U, August, 1989.

107. New Mexico, Public Service Company of New Mexico, Case No. 2262, October, 1989.

108. New Jersey, Public Service Electric & Gas Company, Docket Nos. ER85121163 and GR89060622, October, 1989.

109. Guam, Guam Power Authority, Docket No. 89-002C, January 1990.

110. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 322, January, 1990.

111. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 344, March, 1990.

112. Georgia, Southern Bell Telephone Company, Docket No. 3905-U, May, 1990.

113. Georgia, Southern Bell Telephone Company, Docket No. 3905-U (Surrebuttal and incentive regulation), June, 1990 and August, 1990.

114. Guam, Guam Power Authority, Docket No. 89-002, August 1990.

115. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 334, October, 1990.

116. Colorado, US WEST Communications Inc., Docket No. 90S-544T, January, 1991.

117. New Jersey, United Telephone Company of New Jersey, Docket Nos. TR9007-0726J, February, 1991.

118. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 345, April, 1991.

119. U.S. Virgin Islands, Virgin Islands Telephone Corporation, Docket No. 334, On Remand, July, 1991.

120. Georgia, Georgia Power Company, Docket No. 4007-U, August, 1991.

121. Colorado, US WEST Communications Inc., Docket No. 90A-655T, September 1991.

122. Georgia, GTE - South, Docket No. 4003-U, December 1991.

123. Georgia, Southern Bell Telephone Company, Docket No. 3987-U (Cross Subsidy issues), January 1992.

124. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 355, May 1992.

125. New Jersey, Public Service Electric & Gas Company, Docket Nos. ER91111698J, May 1992.

126. Guam, Guam Power Authority, Docket No. 92-001, August 1992.

127. New Jersey, New Jersey Bell Telephone Company, Docket Nos. TO92030358, (Alternative Form of Regulation), September 1992.

128. Guam, Guam Power Authority, Docket No. 92-009, November 1992.

129. Guam, Guam Power Authority, Docket No. 92-001, Supplemental, November 1992.

130. Georgia, Southern Bell Telephone Company, Docket No. 4232-U, January 1993.

131. U.S. Virgin Islands, Rules & Regulations re: Customer Owned Coin-Operated Telephones, Docket Nos. 285 and 319, February 1993.

132. U.S. Virgin Islands, SASA Complaint re: Customer Owned Coin-Operated Telephones, Docket No. 356, February 1993.

133. Georgia, Southern Bell Telephone Company, Docket No. 3905-U, March 1993.

134. U.S. Virgin Islands, Vitran Bus Service, Docket No. 357, April 1993.

135. Colorado, Public Service Company of Colorado, Docket No. 93S-001EG, May 1993.

136. New Jersey, New Jersey Natural Gas Company - Incentive Rate Regulation, Docket No. GR93050154, December 1993.

137. Guam, Guam Telephone Authority, Docket No. 93-011, December 1993.

138. U.S. Virgin Islands, Virgin Islands Telephone Corporation - Cellular Telephone Service, Docket No. 332, January 1994.

139. Guam, Guam Municipal Golf, Docket No. 93-009, February 1994.

140. U.S. Virgin Islands, Virgin Islands Water & Power Authority, Docket No. 378, March 1994.

141. Virginia, Virginia Cable Television Association, Case No. PUC930036, March 1994.

142. Virginia, Virginia Cable Television Association, Rebuttal, Case No. PUC930036, March 1994.

143. Guam, Guam Telephone Authority Rate Case Phase II, re: Called ID, etc., Docket No. 93-011, Late 1994.

144. Guyana, Guyana Rate Case, 1995.

145. Virgin Islands, Virgin Islands Water and Power Authority Rate Case, Docket No. 378, 1995.

146. Virgin Islands, Virgin Islands Water and Power Authority Water Rate Case, Docket No. 481, 1995.

147. Guam, Guam Power Authority Rate Case, Docket No. 95-001, Late 1995.

148. Guam, Guam Power Authority, Customer Service Agreement, Docket No. 89-002, 1995/1996.

149. Virgin Islands, Virgin Islands Water and Power Authority Rate Case Emergency, Docket No. 500, Early 1996.

150. Virgin Islands Virgin Islands Telephone Company, VITELCO Private Line, Docket No. 486, March 1996.

151. Guam, Guam Power Authority Rate Case, Phase I Stipulation, Docket No. 96-004, May 1996.

152. U.S. Virgin Islands, Virgin Islands Water and Power Authority, Docket No. 500, June 1996.

153. New Jersey, Donnelley, August 1996.

154. U.S. Virgin Islands, Virgin Islands Water and Power Authority, Docket No. 500, September 1996.

155. Guam, Guam Telephone Authority Rate Case Stipulation, Re: Access charges, Private Line, Inside Wire, Docket No. 96-007, August 1996.

156. Guam, Guam Power Authority Rate Case, Phase II Testimony, Docket No. 96-004, December 1996.

157. Guam, Guam Telephone Authority Rate Case, Phase I and Phase II, March 1997.

158. U.S. Virgin Islands, Virgin Islands Telephone Company, Docket 513, July 1998

159. Guam, Guam Power Authority Rate Case, Docket 98-02, Ongoing.

160. Guyana, Guyana Telephone and Telegraph, Rate Filing 1-97 (amended), March 1999.

161. Georgia, BellSouth Telecommunications, Inc., Docket No. 7061-U. August 1997.

162. Louisiana, BellSouth Telecommunications, Inc., September 1997. Docket Nos. U-22022 & U-22093.

163. Alabama, BellSouth Telecommunications, Inc., Docket No. 26069. September 1997.

164. Tennessee, Proceeding to Establish "Permanent Prices" for Interconnection and Unbundled Network Elements, October 1997. Docket No. 97-01262.

165. Kentucky, Inquiry into Universal Service and Funding Issues, Administrative Case No. 360. November 1997.

166. South Carolina, Proceeding to Review BellSouth Telecommunications, Inc.'s Cost for Unbundled Network Elements and Interconnection Arrangements, Docket No. 97-374-C. November 1997.

167. Louisiana, The Development of Rules and Regulations Applicable to the Entry and Operations of and the Providing of Services by in the Local Intrastate and/or Interexchange Telecommunications Market in Louisiana (Universal Service), Docket No. U-20883 Subdocket A, January 1998.

168. North Carolina, Universal Service Support Mechanisms Pursuant to Section 254 of the Telecommunications Act of 1996, Docket No. P-100 Sub. 133b, January 1998.

169. Alabama, Implementation of the Universal Service Requirements of the Telecommunications Act of 1996, Docket No. 25980, February 1998.

170. Kentucky, Inquiry into Universal Service Funding Issues, Administrative Case 360, February 1998.

171. South Carolina, Proceeding to Establish Guidelines for an Intrastate Universal Service Fund, Docket No. 97-239-C. March 1998.

172. North Carolina, Proceeding to Determine Permanent Pricing for Unbundled Network Elements, Docket No. P-100 Sub 133d, March 1998.

173. Mississippi, In the Matter of the Need to Select a Forward-Looking Cost Proxy Model for Calculation of Universal Service Support from the Federal High-Cost Universal Service Fund, Docket No. 98-AD-035, March 1998.

174. Mississippi, Generic Proceeding to Establish "Permanent" Prices for BellSouth Interconnection and Unbundled Network Elements, Docket No. 97-AD-544, March 1998.

175. Tennessee, Application of the Hatfield Model to the determination of Universal Service Funding requirements, Docket No. 97-00888, April 1998.

176. Florida, In Re: Determination of the Cost of Basic Local Telecommunications Service, pursuant to Section 364.025, Florida Statutes, Docket No. 980696-TP, September 1998.

EXHIBIT B

STATEMENT OF QUALIFICATIONS

MICHAEL D. DIRMEIER
PRINCIPAL,
GEORGETOWN CONSULTING GROUP, INC.

EXHIBIT B

Statement of Qualifications

Michael D. Dirmeier
Principal, Georgetown Consulting Group, Inc.

Education

M.B.A. in Finance, 1973, University of Chicago

B.S. in Physics, 1971, Texas A&M University

Certificate of Management Accounting

Employment

May 1979 to present	Principal, Georgetown Consulting Group, Inc.
July 1976 to April 1979	Consultant and Senior Consultant, Consulting Division, Touche Ross & Company
January 1974 to June 1976	Financial Planning Analyst, The Bendix Corporation

Utility Regulatory Experience

Mr. Dirmeier has provided expert testimony in over 90 proceedings involving telecommunications, electric and water utilities. The jurisdictions in which Mr. Dirmeier has appeared include: Arkansas, Colorado, Delaware, District of Columbia, Florida, Georgia, Maryland, Mississippi, New Mexico, New Jersey, New York, Nuclear Regulatory Commission, Oklahoma, Pennsylvania, South Carolina, U.S. Virgin Islands, Virginia. A list of the proceedings in which Mr. Dirmeier has testified and/or filed testimony is attached. Mr. Dirmeier has extensive experience in the application of computer models to the analysis of utility issues.

Regulatory Participation of
Michael D. Dirmeier
(Through September, 2000)

1. New Jersey, West Keansburg Water Co., Docket No. 7710-1026, June 1978. Accounting and revenue requirements. Sponsored by Department of the Public Advocate.

2. U.S. Virgin Islands, Virgin Islands Telephone Company, Docket No. 180, 1978. Depreciation rates. Sponsored by Staff of Public Service Commission.

3. New Jersey, Middlesex Water Company, Docket No. 793-269, August 1979. Accounting and revenue requirements. Sponsored by Department of the Public Advocate.

4. South Carolina, PURPA ratemaking standard, April 1980. Sponsored by Public Advocate.

5. New York, New York Telephone Company, Docket No. 27710, July 1980. Accounting issues. Sponsored by Public Advocate.

6. New Jersey, Hackensack Water Company, Docket No. 804-275, September 1980. Emergency proceeding. Sponsored by Department of the Public Advocate.

7. New York, Long Island Lighting Company, Docket No. 27774, November 1980. Accounting issues. Sponsored by Suffolk County.

8. Pennsylvania, Metropolitan Edison Company, Docket No. R-80051196, December 1980. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

9. Pennsylvania, Pennsylvania Electric Company, Docket No. R-80051197, December 1980. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

10. New Jersey, South Jersey Gas Company, Docket No. 808-517, February 1981. Treatment of over-earnings arising from experimental tariff. Sponsored by Department of the Public Advocate.

11. New Jersey, Hackensack Water Company, Docket No. 815-447, June 1981. Emergency rate proceeding. Sponsored by Department of the Public Advocate.

12. New Jersey, New Jersey Bell Telephone Co., Docket No. 815-458, October 1981. Accounting and revenue requirements. Sponsored by Department of the Public Advocate.

13. Pennsylvania, Metropolitan Edison Company, Docket No. R-80011601, November 1981. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

14. Pennsylvania, Pennsylvania Electric Company, Docket No. R-80011602, November 1981. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

15. New Jersey, Hackensack Water Company, Docket No. 815-447, March 1982. Accounting and revenue requirements. Sponsored by Department of the Public Advocate.

16. Pennsylvania, Bell Telephone Company of Pennsylvania, RID 1819, April 1982. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

17. New Jersey, Atlantic City Electric Company, Docket No. 822-116, July 1982. Accounting and revenue requirements. Sponsored by Department of the Public Advocate.

18. New Jersey, New Jersey Natural Gas Company, Docket No. 815-459, July 1982. Sponsored by Department of the Public Advocate.

19. Maryland, Potomac Electric Power Company, Case No. 7662, November 1982. Accounting and revenue requirements. Sponsored by Staff of Public Service Commission.

20. Pennsylvania, Duquesne Light Company, Docket No. R-21945, March 1982. Excess costs incurred due to nuclear outage. Sponsored by Office of the Public Advocate.

21. Colorado, Mountain Bell Telephone Company, I&S 1575, September 1982. Depreciation methodology. Sponsored by coalition of municipalities.

22. New York, Long Island Lighting Company, PSC Case No. 28252, February 1983. Shoreham phase-in. Sponsored by Suffolk County.

23. Pennsylvania, Metropolitan Edison Company, Docket No. R-822249, May 1983. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

24. Pennsylvania, Pennsylvania Electric Company, Docket No. R-822250, May 1983.

Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

25. Pennsylvania, Bell Telephone Company of Pennsylvania, Docket R-811819, August 1983. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

26. Mississippi, South Central Bell Telephone Company, Docket No. U-4415, January 1984. Accounting and revenue requirements, divestiture proceeding. Sponsored by Attorney General.

27. Colorado, Public Service Company of Colorado, I&S 1640, February 1984. Accounting and revenue requirements. Sponsored by Office of the Public Advocate.

28. New Jersey, Atlantic City Electric Company, Docket No. 822-116, August 1983. Levelization of long-term purchase power contract. Sponsored by Department of the Public Advocate.

29. Florida, Southern Bell Telephone Company, Docket No. 820263-TP, August 1984. Accounting and revenue requirements, divestiture proceeding. Sponsored by Public Advocate.

30. U.S. Nuclear Regulatory Commission, Long Island Lighting Company, Shoreham Nuclear Power Station, Docket No. 50-322-OL-4, 1984. Financial requirements for low power license. Sponsored by Suffolk County.

31. Arkansas, Arkansas Power & Light Company, Docket No. 84-249-U, June 1985. Financial nature of system agreements and construction of Grand Gulf Nuclear Plant. Sponsored by Staff of Public Service Commission.

32. New Jersey, Hackensack Water Company, Docket No. WR8506-663, October 1985. Accounting and revenue requirements. Sponsored by Department of the Public Advocate.

33. New Mexico, Public Service Company of New Mexico, Case No. 1916, July 1985. Accounting and revenue requirements. Sponsored by Attorney General.

34. New Mexico, Public Service Company of New Mexico, Case No. 2011, March 1986. Inventory treatment of sale/leaseback of investment in nuclear unit. Sponsored by Attorney General.

35. Colorado, Mountain States Telephone and Telegraph Company, I&S No. 1700, March 1986. Selected accounting issues in base rate proceeding. Sponsored by Colorado Municipal League.

36. New Mexico, Public Service Company of New Mexico, Case No. 2019, April 1986. Utility holding company. Sponsored by Attorney General.

37. New Jersey, Public Service Electric and Gas Company, BPU Docket No. ER85121163, April 1986. Working capital issues in base rate proceeding. Sponsored by Department of the Public Advocate.

38. New Mexico, Public Service Company of New Mexico, Case No. 1916, June 1986 rehearing. Accounting issues. Sponsored by Attorney General.

39. New Mexico, Gas Company of New Mexico, Case No. 1971, May 1986. Gas purchase clause. Sponsored by Attorney General.

40. New Mexico, El Paso Electric Company, Case No. 2032, June 1986. Sale/leaseback of investment in nuclear unit. Sponsored by Attorney General.

41. Pennsylvania, Metropolitan Edison Company, Docket No. R-860384, 1986. Base rate proceeding. Sponsored by Office of the Public Advocate.

42. Pennsylvania, Pennsylvania Electric Company, Docket No. R-860413, 1986. Base rate proceeding. Sponsored by Office of the Public Advocate.

43. New Mexico, Public Service Company of New Mexico, Case No. 2067, December 1986. Company's annual October inventory filing. Sponsored by Attorney General.

44. New Jersey, Elizabethtown Water Company, OAL Docket Nos. PUC 5353-86, 5351-86, 5354-86 and 5352-86 (consolidated), January 1987. Deposit requirements for water main extensions. Sponsored by developer intervenors.

45. Delaware, Intrastate Competition, PSC Regulation Docket No. 10. Ongoing. Sponsored by Staff of Public Service Commission.

46. District of Columbia, Potomac Electric Power Company, Formal Case No. 852, February 1987. Tax Reform Act of 1986. Sponsored by Office of People's Counsel.

47. District of Columbia, C&P Telephone Company, Formal Case No. 854, April 1987. Tax Reform Act of 1986. Sponsored by Office of People's Counsel.

48. New Mexico, Public Service Company of New Mexico, Case No. 2096, July 1987. Company's annual January inventory filing. Sponsored by Attorney General.

49. Georgia, Georgia Power Company, Docket No. 3673-U, August 1987. Base rate

proceeding. Panel witness responsible for computations of write-off and phase-in plan. Sponsored by Staff of the Public Service Commission.

50. New Jersey, South Jersey Gas Company, BPU Docket Nos. GR8704-329 & GR8608-902, September 1987. Base rate proceeding. Sponsored by Department of the Public Advocate.

51. District of Columbia, Potomac Electric Power Company, Formal Case No. 852-II, November 1987. Tax Reform Act of 1986. Sponsored by Office of People's Counsel.

52. District of Columbia, C&P Telephone Company, Formal Case No. 854-II, November 1987. Tax Reform Act of 1986. Sponsored by Office of People's Counsel.

53. New Mexico, Public Service Company of New Mexico, Case No. 2159, December 1987. Company's annual October inventory filing. Sponsored by Attorney General.

54. New Jersey, Atlantic City Electric Company, Docket No. ER8504434 (Benefits of TRA), January 1988. Company's TRA filing. Sponsored by Department of the Public Advocate.

55. New Mexico, Public Service Company of New Mexico, Case No. 2146, November 1988. Treatment of Excess Capacity. Sponsored by Attorney General.

56. New Jersey, Public Service Electric & Gas Company, BPU Docket No. ER85121163, June 1989. Treatment of proposed 20-year purchase of capacity from AEP-Rockport II. Sponsored by Department of the Public Advocate.

57. Georgia, Georgia Power Company, Docket No. 3840-U, August 1989. Base rate proceeding. Panel witness responsible for computations concerning phase-in and decommissioning expense. Sponsored by Staff of the Public Service Commission.

58. New Mexico, Public Service Company of New Mexico, Case No. 2262, November 1989. Base case. Sponsored by Attorney General.

59. Vermont, Central Vermont Public Service Company, Docket No. 5372, February 1990. Base case. Sponsored by Department of Public Service.

60. Pennsylvania, Pennsylvania Gas and Water Co. and North East Water Company, Docket No. A-210018, P-900453 and R-901726, October & November 1990. Application to purchase utility, petition for accounting methodologies and accounting position in base rate proceeding. Sponsored by Office of Consumer Advocate.

61. New Jersey, Hackensack Water Company, Docket No. WR90080792J, January 1991.

Accounting in a base rate proceeding. Sponsored by Department of the Public Advocate.

62. New Mexico, US WEST, Inc, Case No. 90-255-TC, March 1991. Commission inquiry concerning local calling area for Albuquerque metro area. Sponsored by Attorney General.

63. New Jersey, Atlantic City Electric Company, Docket No. ER90091090J, March 1991. Working capital in a base rate proceeding. Sponsored by Department of the Public Advocate.

64. New Mexico, Plains Electric Generation and Transmission Cooperative, Inc., Case No. 2363, April 1991. Base rate proceeding of an electric cooperative. Sponsored by Attorney General.

65. District of Columbia, C&P Telephone Company, Formal Case No. 850, October 1991. Productivity in PSC's investigation concerning the reasonableness of C&P's rates. Sponsored by Office of People's Counsel.

66. New Mexico, Public Service Company of New Mexico, Case No. 2326, July 1991. Investigation into diversification and divestiture transactions undertaken by PNM. Sponsored by Attorney General.

67. Georgia, Georgia Power Company, Docket No. 4007-U, August 1991. Base rate proceeding. Panel witness responsible for computations and selected rate case issues. Sponsored by Staff of the Public Service Commission.

68. New Jersey, Jersey Central Power & Light Company, Docket No. EM91010067, October 1991. Regulatory treatment and prudence of proposed multi-part agreement to purchase 50% of plant being restored to service, purchase capacity under long-term power sale agreement and participate in construction of a long-distance 500 kV transmission line. Sponsored by Department of the Public Advocate.

69. New Mexico, Public Service Company of New Mexico, Case No. 2408, January 1992. PNM request to sell 50MW of San Juan 4 to the City of Anaheim, CA. Sponsored by Attorney General.

70. Oklahoma, Oklahoma Gas & Electric Company., Cause Nos. PUD 898 & 1055, April 1992. Revenue requirement testimony in a "show cause" proceeding. Sponsored by Attorney General.

71. New Mexico, Public Service Company of New Mexico, Case No. 2429, April 1992. Regulatory treatment of transactions intended to complete the exit from diversification. Sponsored by Attorney General.

72. New Jersey, Public Service Electric & Gas Company, BPU Docket No. EE91081428, April 1992. Regulatory treatment of prematurely retired plant. Sponsored by Department of the Public Advocate.

73. New Mexico, Public Service Company of New Mexico, Case No. 2444, May 1992. Request of the Company to purchase back a portion of previously sold / leased-back nuclear unit. Sponsored by Attorney General.

74. New Mexico, U S WEST, Inc., Case No. 92-90-TC, June 1992. Application of US WEST seeking approval of Customer Local Area Signaling Services (CLASS) Tariffs. Sponsored by Attorney General.

75. New Jersey, Public Service Electric & Gas Company, BPU Docket No. EE91111698J, July 1992. Depreciation, nuclear decommissioning and regulatory treatment of prematurely retired plant. Sponsored by Department of the Public Advocate.

76. New Mexico, Public Service Company of New Mexico, Case No. 2469, October 1992. Financing case - Request of the Company to refinance variable rate debt and replace with variable rate debt. Sponsored by Attorney General.

77. New Jersey, New Jersey Bell Telephone Co., Docket No. TO92030358, October 1992. Request of the Company to replace existing Rate Stability Plan with indexed price increases with sharing in prescribed earnings plans. Economics of "Opportunity New Jersey" infrastructure development proposals. Sponsored by Department of the Public Advocate.

78. District of Columbia, C&P Telephone Company, Formal Case No. 814, Phase III, November 1992. Testimony concerning the Company's application for alternative form of regulation. Sponsored by Office of People's Counsel.

79. New Mexico, U. S. West, Inc., Docket No. 92-227-TC, December 1992. Testimony regarding accounting issues and revenue requirements in base rate proceeding. Sponsored by Attorney General.

80. District of Columbia, C&P Telephone Company, Formal Case No. 926, July, 1993. Testimony concerning cost containment, management compensation, productivity, Other Postretirement Benefits (SFAS 106), salaries and wages, Other Postemployment Benefits (SFAS 112) and accounting for income taxes (SFAS 109). Sponsored by Office of People's Counsel.

81. Georgia, Georgia Power Company, Docket No. 4152-U, August 1993. Testimony concerning appropriate accounting and ratemaking treatment of Clean Air Act Allowances. Sponsored by Staff of the Public Service Commission.

82. New Mexico, U.S. West, Inc., Case No. 93-218-TC, October 1993. Testimony concerning application of utility to expand the local calling area for the Albuquerque metropolitan area. Sponsored by Attorney General.

83. District of Columbia, Potomac Electric Power Company, Formal Case No. 929, October 1993. Testimony in base rate proceeding, addressing issues of Electric Rate Adjustment Mechanism, DSM Surcharge, inclusion of purchased power capacity costs in automatic adjustment clauses. Sponsored by Office of People's Counsel.

84. New York, Consolidated Edison Company, Case Nos. 93-G-0996 and 93-S-0997, April 1994. Testimony concerning appropriate application of productivity in base rate proceeding for gas and steam rates. Sponsored by Utility Workers Union of America, AFL-CIO, Local 1-2.

85. New Jersey, Atlantic City Electric Company, BRC Docket No. ER9402003, OAL Docket No. PUC 1427-94, June 1994. Testimony concerning levelized energy adjustment clause.

86. New Mexico, Public Service Company of New Mexico, Case No. 2567, June 1994. Testimony concerning application of utility to reduce rates and write-off plant and regulatory assets.

87. New York, Consolidated Edison Company, Case No. 94-E-0334, October 1994. Testimony concerning health and safety and productivity issues in application of utility to increase base electric rates. Sponsored by Utility Workers Union of America, AFL-CIO, Local 1-2.

88. Maine, New England Telephone Company, Docket No. 94-254, February 1995. Testimony concerning accounting issues and revenue requirements in base rate proceeding. Sponsored by Staff of the Maine Public Utilities Commission.

89. District of Columbia, Potomac Electric Power Company, Formal Case No. 939, March 1995. Testimony in base rate proceeding, addressing utility risk and costs from ownership, sponsorship and financing of nonregulated affiliate. Sponsored by Office of People's Counsel.

90. New Jersey, IntraLATA Toll Presubscription, BPU Docket No. TX94090388, May 1995. Testimony in proceeding determining whether previously authorized 10XXX intraLATA toll competition should be modified to allow 1+ intraLATA toll presubscription.

91. District of Columbia, Bell Atlantic - Washington, Formal Case No. 814, Phase IV, July 1995. Testimony concerning price cap regulation proposal.

92. Massachusetts, Electric Utility Restructuring, appearance before Legislature's Joint Commission on Energy, November 1995.

93. New York, Electric Utility Restructuring, appearances before Assembly's Committee on Energy, December 1995.

94. New Jersey, Salem Outage, BPU Docket Nos. ES96030158 & ES96030159, April 1996. Testimony in proceeding to determine whether rates for Salem Unit 2 should be made interim.

95. New Mexico, Public Service Company of New Mexico, Case No. 2620, May 1996. Testimony in proceeding concerning formation of nonregulated operations.

96. New Mexico, Southwestern Public Service Co., Case No. 2678, June 1996. Testimony in proceeding concerning merger between SPS and Public Service Company of Colorado.

97. Pennsylvania, Commonwealth Telephone Co., Docket No. P-00961024, June 1996. Testimony concerning alternative regulation and network modernization plan.

98. Massachusetts, Massachusetts Electric Company, DPU 96-25, December 1996. Testimony concerning restructure of utiity industry.

99. Pennsylvania, PECO Energy, Docket No. R-00973953, June 1997. Testimony concerning code of conduct concerning utility actions in a competitive market.

100. Pennsylvania, Pennsylvania Power & Light, Docket No. R-00973954, July 1997. Testimony concerning code of conduct concerning utility actions in a competitive market.

101. Georgia, BellSouth Telecommunications, Inc., Docket No. 7061-U. August 1997. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

102. Louisiana, BellSouth Telecommunications, Inc., September 1997. Docket Nos. U-22022 & U-22093. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

103. Alabama, BellSouth Telecommunications, Inc., Docket No. 26069. September 1997. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

104. Tennessee, Proceeding to Establish "Permanent Prices" for Interconnection and Unbundled Network Elements, October 1997. Docket No. 97-01262. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

105. Kentucky, Inquiry into Universal Service and Funding Issues, Administrative Case No. 360. November 1997. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

106. New Jersey, In the Matter of the Energy Master Plan Phase II Proceeding to Investigate the Future of the Electric Power Industry, BPU Docket Nos.EX9120585Y, EO97070461, EO97070462, EO97070463, November 1997. Testimony concerning stranded cost, market transition, competition and securitization.

107. South Carolina, Proceeding to Review BellSouth Telecommunications, Inc.'s Cost for Unbundled Network Elements and Interconnection Arrangements, Docket No. 97-374-C. November 1997. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

108. Louisiana, The Development of Rules and Regulations Applicable to the Entry and Operations of and the Providing of Services by in the Local Intrastate and/or Interexchange Telecommunications Market in Louisiana (Universal Service), Docket No. U-20883 Subdocket A, January 1998. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

109. North Carolina, Universal Service Support Mechanisms Pursuant to Section 254 of the Telecommunications Act of 1996, Docket No. P-100 Sub. 133b, January 1998. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

110. Alabama, Implementation of the Universal Service Requirements of the Telecommunications Act of 1996, Docket No. 25980, February 1998. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

111. Kentucky, Inquiry into Universal Service Funding Issues, Administrative Case 360, February 1998. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

112. South Carolina, Proceeding to Establish Guidelines for an Intrastate Universal Service Fund, Docket No. 97-239-C. March 1998. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

113. North Carolina, Proceeding to Determine Permanent Pricing for Unbundled Network Elements, Docket No. P-100 Sub 133d, March 1998. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

114. Mississippi, In the Matter of the Need to Select a Forward-Looking Cost Proxy Model for Calculation of Universal Service Support from the Federal High-Cost Universal Service Fund, Docket No. 98-AD-035, March 1998. Testimony concerning the application of the Hatfield Model to the determination of Universal Service Funding requirement.

115. Mississippi, Generic Proceeding to Establish "Permanent" Prices for BellSouth Interconnection and Unbundled Network Elements, Docket No. 97-AD-544, March 1998. Testimony concerning the application of the Hatfield Model to the determination of Telric unbundled network element rates.

116. Tennessee, Application of the Hatfield Model to the determination of Universal Service Funding requirements, Docket No. 97-00888, April 1998.

117. New Mexico, In the Matter of the Commission's Investigation of the Rates for the Electric Service of Public Service Company of New Mexico, Case No. 2761, April 1998. Testimony in base rate proceeding.

118. Florida, In Re: Determination of the Cost of Basic Local Telecommunications Service, pursuant to Section 364.025, Florida Statutes, Docket No. 980696-TP, September 1998. Testimony concerning the application of the HAI Model to the determination of universal service fund requirements.

119. Maryland, In the Matter of the Commission's Inquiry into the Provision and Regulation of Electric Service, Stranded Cost of Delmarva Power Company, Docket No. 8795, December 1998. Testimony filed concerning the appropriate quantification of stranded cost.

120. Maryland, In the Matter of the Commission's Inquiry into the Provision and Regulation of Electric Service, Stranded Cost of Potomac Edison Company, Docket No. 8797, January 1999. Testimony filed concerning the appropriate quantification of stranded cost.

121. New Mexico, In the Matter of An Investigation Into the Rates and Service of US WEST Communications, Inc., Case No. 3008, March 2000. Accounting testimony in base rate proceeding.

122. New Mexico, In the Matter of Public Service Company of New Mexico's Transition Plan Filed Pursuant to the Electric Utility Industry Restructuring Act of 1999, Case No. 3137 Part II, July 2000. Testimony concerning Code of Conduct.

123. New Mexico, In the Matter of Southwestern Public Service Company's Transition Plan Filing for Implementation of Customer Choice Service Pursuant to the New Mexico Electric Utility Industry Restructuring Act 1999, Case No. 3220 Part II, September 2000. Testimony concerning Code of Conduct.

EXHIBIT C

STATEMENT OF QUALIFICATIONS

DAVID C. NEWTON

EXHIBIT C

Statement of Qualifications

David C. Newton

Mr. Newton has spent 32 years in telecommunications network planning and design. Since 1991, Mr. Newton has served as a consulting telecommunications network engineer, advising clients and testifying in regulatory proceedings on a variety of network matters. Prior to his consulting work, Mr. Newton spent 27 years with the Southern New England Telephone Company, where he held numerous positions in network planning and network design.

Mr. Newton received a Bachelor of Science degree in Operation Management from Quinnipiac College and he holds an Associate Science degree in Electrical Engineering from Hartford State Technical College, awarded in 1965.

A summary of Mr. Newton's professional experience with Southern New England Telephone Company and a list of the engagements he has performed as a consulting telecommunications network engineer are provided on the attached sheets.

Network Planning and Design Experience With
Southern New England Telephone Company

1987 - 1991 District Manager - Network Planning

Responsible for directing the development and implementation of strategic long range plans for the evolution of the telephone network for the State of Connecticut, specifically, the technical evaluation and strategic planning for all components of the SNET network -- central office switching, interoffice facilities, local outside plant, Signalling System 7, operator services systems and the E911 network.

1984 - 1987 Staff Manager - Network Planning

Responsible for the economic analysis and planning for the development of new technology in all facets of the network.

1981 - 1984 Manager - Network Design

Responsible for directing analyses of equipment condition and utilization and for managing the preparation of equipment specifications.

1966 - 1981 Various network field assignments in network planning and design

Activities included traffic analysis, trunk network forecasting and application, switch capacity analysis, switch design, switch translations and switch administration.

Consulting Engagements

Guam Public Utilities Commission

Docket No. 93-008 (ongoing) On behalf of the Guam Public Utility Commission, perform annual reviews of the construction program of the Guam Telephone Authority.

Docket No. 97-001 (May 1997) On behalf of the Guam Public Utility Commission, evaluation of the ISDN tariff proposal of the Guam Telephone Authority.

Docket No. 96-007 (October 1996) On behalf of the Guam Public Utility Commission, evaluation of the private line tariff proposal of the Guam Telephone Authority.

Docket No. 93-007 (October 1996) On behalf of the Guam Public Utility Commission, development of a set of service standards for application to the Guam Telephone Authority.

Docket No. 92-005 (November 1992) On behalf of the Guam Public Utility Commission, evaluation of the capital program of the Guam Telephone Authority.

New Jersey Board of Regulatory Commissioners

Docket No. TO92030358 (September 1992) On behalf of Department of Public Advocate, analysis and evaluation of the proposed Network Modernization Plan of the New Jersey Bell Telephone Company, including deployment of narrowband and broadband services, switching deployment alternatives and use of HSDL in the loop.

Pennsylvania Public Utilities Commission

Docket No. P-00961024 (June 1996) On behalf of Office of Consumer Advocate, analysis and evaluation of the proposed Network Modernization Plan of the Commonwealth Telephone Company.

Virgin Islands Public Service Commission

Docket No. 398 (August 1995) On behalf of Virgin Island Public Service Commission, evaluated private line tariff proposal of VITELCO.

Docket No. 348 (March 1994) On behalf of Virgin Island Public Service Commission, evaluation of the network design and operation for the Enhanced 911 network for the Virgin Islands.

Guyana Public Utilities Commission

Docket No. 95 (January 1997) On behalf of Guyana Public Utilities Commission, evaluated the condition of the network of the Guyana Telephone Company and its compliance with certain modernization mandates included in the original condition of purchase.