ORIGINAL

BELLSOUTH TELECOMMUNICATIONS, INC.

DIRECT TESTIMONY OF JOSEPH H. PAGE

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

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Q. PLEASE STATE YOUR NAME, ADDRESS AND OCCUPATION.

A. My name is Joseph H. Page. My business address is 675 W. Peachtree St., N.E., Atlanta, Georgia. I am a Manager in the Finance Department of BellSouth Telecommunications, Inc. (hereinafter referred to as "BellSouth" or "the Company"). My area of responsibility relates to economic costs.

Q. PLEASE PROVIDE A BRIEF DESCRIPTION OF YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.

A. I graduated from Southern Polytechnic University with a Bachelor of Science degree in Applied Computer Science. I earned a Master of Business Administration degree at Georgia State University. I have attended several Bell Communications Research, Inc. ("Bellcore") courses on economic principles related to service cost studies. Within BellSouth, I have attended several Company-provided courses on digital telephone network technology.

In 1986, I was first employed at BellSouth as an Assistant Staff Manager – Economic Costs. Here I performed numerous central office switching cost studies using the Bellcore Switching Cost Information System model. In 1990 I was promoted to Staff Manager – Economic Analysis Planning where I was responsible for strategic applications of information technology to service cost studies. I also served as staff consultant to economic cost analysts on cost study methodology. In 1994, I accepted the position of Manager – Finance and Administration for BellSouth Entertainment, Inc. Here I performed business cases, profitability analyses, and pricing studies for Consumer Broadband Video services using Fiber, Hybrid Fiber Coax, and Asynchronous Transfer Mode (ATM) technologies.

From 1996 to 1999, as a principal of JK Page Enterprises, Inc., I provided consulting services in the development and implementation of economic cost studies and financial analyses to telecommunications companies. In this capacity I was instrumental in developing the first Total Element Long Run Incremental Cost (TELRIC) models used to set reciprocal compensation rates for paging carriers. In association with INDETEC International, Inc., I developed the switching module of the Benchmark Cost Proxy Model (BCPM), a universal service cost model jointly sponsored by BellSouth, US West and Sprint Corporation. I also authored position papers, provided witness support, and filed direct testimony on behalf of the BCPM Sponsors.

In 1999 I returned to BellSouth where I managed development of Local Switching, Interconnection, Remote Internet Access, and Fast Packet cost studies. In late 1999 I accepted my current position in which I am responsible for testifying on cost matters, internal consulting on cost and business case methodology, and directing the development of switching cost models.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to explain how BellSouth developed the Unbundled Network Element (UNE) material prices for Unbundled Exchange Ports, Features, Unbundled Switching, and Common Transport. In doing so, I introduce a new BellSouth cost model for service and element-specific switching costs. This model, the Simplified Switching Tool© (SST), replaces Telcordia's Switching Cost Information System / Intelligent Network (SCIS/IN) and Network Cost Analysis Tool (NCAT) models used in the previous UNE studies.

Q. WHAT WAS YOUR INVOLVEMENT IN THE DEVELOPMENT OF THE SWITCHING COST STUDIES?

A. I led the project team that created the SST beginning in December, 1999. I performed research and analysis to determine how to best streamline the cost study process to enable deaveraging of switching costs, and developed the initial Excel spreadsheet models. I directed and coordinated the efforts of the SST team as it developed the methodology, inputs, mechanized program, and documentation associated with the model.

Q. PLEASE EXPLAIN IN GENERAL THE PROCESS BELLSOUTH USED TO DEVELOP MATERIAL PRICES FOR EXCHANGE PORTS, FEATURES, UNBUNDLED SWITCHING, AND COMMON TRANSPORT.

A. Switching material prices are generally developed in two stages. The first stage of the process is to develop fundamental studies that identify material prices for basic switching functions. The basic switching functions include non-traffic sensitive line termination, call setup, and line and trunk usage. The second stage of the process is to identify, for each network element or retail service, which of the basic switching functions are used, along with material prices unique to that element or service.

Q. WHAT COST MODELS DID BELLSOUTH EMPLOY TO DEVELOP SWITCHING MATERIAL PRICES?

A. BellSouth used the Telcordia Switching Cost Information System / Model Office (SCIS/MO) to compute fundamental switching material prices. BellSouth used a newly developed model, the Simplified Switching Tool (SST) to develop material prices for individual Exchange Port, Feature, and Local Usage UNEs.

Q. WHAT WERE BELLSOUTH'S GOALS IN SELECTING COST MODELS FOR SWITCHING?

A. BellSouth had several goals in selecting or creating models for this filing:

- Openness,
- Compliance with TSLRIC and TELRIC Methodologies,
- Capability to Deaverage (if required),
- Flexibility,
- Streamlined Process, and
- Reduced Reliance Upon Proprietary Data.

Q. WHY WAS IT NECESSARY TO CREATE A NEW MODEL?

A. In part, the creation of the SST is an outgrowth of BellSouth's continual desire to improve its cost modeling, in terms of both methodology and operational efficiency. The SST, because it is based upon Microsoft Excel workbooks, is inherently open and available to inspection by all interested parties. The SST templates (workbooks not populated with input data) are open and available for public inspection and use. This is in contrast with Telcordia's SCIS/IN, which is the intellectual property of Telcordia and can only be examined upon execution of a confidentiality agreement.

The suite of models (SCIS/MO, SCIS/IN, and the Telcordia Network Cost Analysis Tool [NCAT]) used in the previous round of UNE studies was impracticable for the purpose of wire center-specific cost studies. These models were designed around a single-run orientation, which in general required that results from each model be printed and then re-keyed as input to the next model. This process is time-consuming and difficult in the context of performing studies for almost 200 wire centers.

With SCIS/IN, BellSouth relied upon a model that, despite the best efforts of its developers, required considerable lead-time to request and implement changes. Because the program is coded in a traditional programming language, implementation of new or revised network elements could take weeks. The SST provides the flexibility to add or change elements in a matter of hours. This fast programming turnaround was critical in producing cost studies to comply with the Federal Communications Commission (FCC) rule 319.

Another major need was to simplify the methodology used in the models, while preserving the accuracy for pricing purposes. While the previous SCIS/IN and NCAT methodologies were precise, they required enormous amounts of input data, much of which was confidential and proprietary. Furthermore, they relied upon extremely complicated algorithms to determine, for each network element, the types and amounts of network resources required. These algorithms required large amounts of resources to research and develop, as well as to understand. The new SST algorithms are more accessible and understandable. As a result, it is now much easier to verify that BellSouth's switching cost studies comply with TELRIC principles and accurately portray the network resources used by each network element.

Q. HOW IS THE SST STRUCTURED?

A. The SST comprises two separate Microsoft Excel workbooks, the SST-Usage (SST-U) and the SST-Ports (SST-P). In general, the SST-U covers the UNE elements that were contained in NCAT (Local Switching and Common Transport) and SCIS/IN (Features). SST-P encompasses all of the individual Excel workbooks that BellSouth previously employed for developing Exchange Port material prices.

Both SST modules are provided with a mechanized user interface that allows the user to import study results from the SCIS Model Office (SCIS/MO) and to generate a material price sheet for input to the BellSouth Cost Calculator©.

Q. DOES THE SST REQUIRE PROPRIETARY DATA?

A. Yes. The SST as provided with this filing does rely upon some proprietary data, although in much smaller amounts than SCIS/IN and NCAT. Certain data values, such as feature hardware prices and switch realtime specifications, are obtained from the switch vendors, Lucent Technologies and NORTEL. Some Telcordia data inputs are employed, where necessary, to keep the SST consistent with the SCIS/MO outputs that it uses. Finally, the SCIS/MO outputs, because they are switch vendor-specific and reflect BellSouth discount levels, are considered proprietary.

Q. WHAT METHODOLOGY DID BELLSOUTH USE TO DEVELOP BASIC SWITCH FUNCTIONALITY MATERIAL PRICES?

A. BellSouth used SCIS/MO to develop material prices for basic switch functionality.

Q. HOW DOES SCIS/MO DEVELOP BASIC SWITCHING MATERIAL PRICES?

A. By essentially replicating the actual switch engineering rules provided by the switch vendors, the SCIS/MO model uses a "bottoms-up" approach to establish the fundamental switching material prices for each central office switch included in the cost study. The individual switch architecture and the switch vendors' engineering rules are used to identify the material price drivers. The material price drivers are reflected as SCIS/MO user input data such as originating plus terminating (O+T) usage expressed in CCS (one hundred call seconds), quantity of analog lines, quantity of digital lines, processor utilization, etc. Using this input data in conjunction with the switch vendor engineering rules, material price tables, vendor discount tables, and other miscellaneous tables within the model, SCIS/MO employs equations to determine the material prices associated with the various central office functions. The functional categories express switching equipment components or groups of components on a fundamental unit basis, e.g., per line, per CCS, per call, per millisecond, etc.

Q. WHY DOES THE SCIS/MO APPROACH PRODUCE APPROPRIATE LONG RUN INCREMENTAL COST STUDIES?

A. As stated above, SCIS/MO is predicated on the engineering rules provided by the switch vendors. Underlying these rules are the following facts:

- The switch is a partitioned entity. The switch is not simply a single material price that is shared by all services and features.

- The deployment of most services and features generally do not impact the entire switch. Services and features may rely on different components of the switch depending upon the resources required to provide the proper functionality.

- Some switching components are traffic sensitive and others are non-traffic sensitive. For example, the number of switch terminations (ports) is non-traffic sensitive.

SCIS/MO's categorization of switching material price and the expression of that material price on a fundamental unit basis allows for the proper assignment of switching components that are used by multiple features and/or services. For instance, SCIS/MO's expression of the processor material price on a per millisecond basis enables the SST to determine the processor related material price of a given feature by multiplying the material price per millisecond by the amount of time (expressed in milliseconds) the feature uses the processor. Since the material price per millisecond is the same regardless of the feature or service under study, the resulting cost will vary depending upon the incremental demand the feature or service places on the switch processor.

Q. DID BELLSOUTH PERFORM A NEW SCIS/MO FUNDAMENTAL STUDY FOR THIS UNE FILING?

A. Yes. This study uses the SCIS/MO version 2.6.1. Previous studies for Florida were performed using SCIS/MO version 2.3.

Q. HOW DO THE BASIC SWITCHING MATERIAL PRICES FROM THE NEW SCIS/MO STUDIES COMPARE WITH THE PREVIOUS STUDIES?

A. In general, switching costs have declined in the time span between the two studies. BellSouth's effective discount levels have changed significantly, as well. A second major conclusion is that the disparities between BellSouth's two major switch technologies, the Lucent 5ESS and NORTEL DMS-100, have grown smaller. For example, the cost of a basic line termination is now much more similar across the two technologies than before.

BellSouth believes that the downward changes in cost are reasonable and appropriate given the changes in switch architecture and price levels over the past several years. Both switch vendors have introduced new switch processors and peripherals that provide more capacity per dollar material price than before. For example, call processing (realtime) material prices are now lower with the introduction of the SM2000 processor in the Lucent 5ESS and the SN70 processor in the NORTEL DMS-100. The introduction of GR303 based line terminating equipment has significantly lowered line port and usage costs. New OC3 capable trunking peripherals have lowered trunk termination costs.

Q. SINCE BELLSOUTH REPLACED SCIS/IN WITH A NEW MODEL, WHY DID IT NOT ALSO REPLACE SCIS/MO?

A. Presently, SCIS/MO meets the need to conveniently perform deaveraged studies. Since the SCIS/MO process inherently looks at individual switches, it already contains all the data needed for switch-specific studies. No changes to the basic SCIS/MO process were needed to support wire center-specific studies.

Q. WHAT COST MODELS AND PROCEDURES DID BELLSOUTH EMPLOY TO DEVELOP MATERIAL PRICES FOR UNBUNDLED EXCHANGE PORTS?

A. BellSouth used the Simplified Switching Tool - Ports (SST-P) to produce material prices for Unbundled Exchange Ports. The SST-P provides non-traffic sensitive material prices for a variety of line and trunk ports. For

UNEs, the model addresses 2-wire and 4-wire analog line ports, 2-wire Direct Inward Dialing (DID) ports, Digital Direct Integration Termination Service (DDITS) ports, 2-wire ISDN (Basic Rate Interface [BRI]) and 4-wire ISDN (Primary Rate Interface [PRI]) ports. The 2-wire analog port can be used to terminate voice grade residential, business, Centrex, PBX, and coin lines.

The model accepts, as input, a variety of line types SCIS/MO, including analog lines, Access Interface Unit (AIU) lines (5ESS), TR008 digital lines, and GR303 digital lines.

Q. WHAT COST MODELS AND PROCEDURES DID BELLSOUTH EMPLOY TO DEVELOP MATERIAL PRICES FOR UNBUNDLED FEATURES?

A. BellSouth used the SST-Usage (SST-U) model to compute the UNE material prices for features. The SST-U uses SCIS Model Office functional material prices in combination with switch vendor-specific hardware prices and processor realtime estimates to identify, in material price dollar terms, the resource load that each feature places upon the switch.

Q. WHAT WERE THE OBJECTIVES OF THE SST-U FEATURE METHODOLOGY?

A. The first objective was to create a feature cost study model that was streamlined and understandable. It should create cost studies that accurately reflect UNE cost, without the extraordinary complexity and confidential data requirements of SCIS/IN. Another objective was efficiency. The model had to be capable of producing studies in volume, on a wire center-specific basis if necessary, with mechanized input and output feeds.

Q. HOW IS THE SST-U FEATURE MATERIAL PRICE METHODOLOGY DIFFERENT FROM SCIS/IN?

A. SCIS/IN contains several individual feature algorithms, each of which is specific to a switch feature. For example, Three-Way Calling, Call Transfer, and Call Waiting Deluxe have unique cost formulas, each with slightly different assumptions about processor realtime usage due to the feature. The SST, by contrast, contains about one dozen feature category algorithms. Individual features are assigned to one of the categories according to the set of switch resources they consume. For example, the three features mentioned above are all costed with the same algorithm, because they use the same basic set of switch resources.

Q. DOES THE SST USE SCIS/IN FEATURE ALGORITHMS?

A. No. While there are some conceptual parallels between the two models (both start with the same set of basic switching resources identified by SCIS/MO), the SST is a streamlined and independent approach that does not rely upon SCIS/IN for any critical switching formulas or data. In some limited instances, BellSouth used material prices from the SCIS/IN database as input to the SST.

Q. WHAT ARE THE ADVANTAGES OF THE SST FEATURE APPROACH OVER THE PREVIOUS APPROACH?

A. The first advantage is streamlined requirements of the model. As discussed above, the SST requires far fewer data inputs such as feature-specific realtime estimates. There are far fewer feature material price formulas to study and consider.

The second advantage is efficiency, especially when performing deaveraged studies. The model is designed to mechanically import the voluminous switch-specific SCIS/MO studies and then create a mechanized material price file for the BellSouth Cost Calculator. The number of paper worksheets and reports is kept to a minimum.

A third advantage is openness. The SST material price formulas are not confidential and are implemented within an Excel workbook, so they can be easily examined and verified by interested parties.

Q. HOW WERE THE SPECIFIC SST-U FEATURE CATEGORIES DEVELOPED, AND WHY ARE THEY RELEVANT?

A. Specific central office switch features differ in the types of switch resources they consume. The processor material prices comprise one category of feature-related material prices. Some of the features also tie-up an additional call path. For example, a three-way call invokes another call path in addition to the one established with the original call. Special hardware is required to complete some of the feature calls. Finally, some feature-related calls require queries to the SS7 database in order to complete the call.

In order to categorize the features, BellSouth looked at approximately 100 of the most significant features in terms of demand. Included in this set were the individual feature UNEs studied previously in Florida. In the spirit of simplification, we did not attempt to categorize each and every switch feature; only the ones with significant market interest. Based on vendor documentation and examination of detailed SCIS/IN formulas, each feature was assigned to a category depending on the resources it uses. For example, some use only the processor. Some may use only special hardware. Some use combinations of resources.

BellSouth believes that by using this approach it has created a feature cost methodology that is streamlined and understandable, while at the same time addressing all the features, functions, and capabilities of the switch that customers are likely to use. This approach is conservative from a pricing viewpoint, because it does look at only the most-commonly used features and does not attempt to capture the large number of relatively obscure and little-used features available.

Q. HOW DO THE FEATURE COST RESULTS FROM THE SST

COMPARE TO THOSE FROM SCIS/IN?

A. Given the same set of customer characteristic inputs and Fundamental Study inputs, the SST will produce results that are overall very similar to those produced by SCIS/IN. For any given individual feature, an SCIS/IN cost study may differ somewhat from the SST cost study, because the SST produces costs which represent a broad average of all the features within an SST feature category.

Most of the differences between the new feature cost studies and previous cost studies are due to changes in the Fundamental Study inputs, reflecting a general decline in BellSouth's switching capacity costs over the past several years.

Q. WHAT COST MODELS AND PROCEDURES DID BELLSOUTH EMPLOY TO DEVELOP MATERIAL PRICES FOR UNBUNDLED SWITCHING AND COMMON TRANSPORT?

A. BellSouth used the SST-Usage (SST-U) model to compute the UNE material prices for Unbundled Switching and Common Transport. The SST-U identifies, in material price dollar terms, the resource load that each minute of use places upon the end office or tandem switch. It does this by processing SCIS Model Office functional material prices in combination with switch processor realtime estimates and customer calling characteristics. The model also uses outputs from BellSouth's Interoffice and SS7 Fundamental Studies to develop the cost per minute of use for Common Transport Mileage and Facilities Terminations.

Q. BELLSOUTH USED THE TELCORDIA NCAT MODEL FOR PREVIOUS UNE STUDIES. WHY WAS NCAT REPLACED WITH SST FOR THIS COST STUDY?

A. NCAT is being replaced at BellSouth for many of the same reasons as SCIS/IN. BellSouth discontinued using NCAT in 1997 and no longer maintains a license to use that model. NCAT made extensive use of proprietary and confidential Telcordia cost formulas derived from SCIS/IN. SST contains no confidential cost algorithms. NCAT, like SCIS/IN, required large quantities of detailed and proprietary inputs, for example processor realtimes. SST has been simplified to require much less of this proprietary data. Finally, NCAT did not lend itself well to the production of wire center-specific cost studies.

Q. HOW DID YOU COMPUTE RIGHT TO USE (RTU) FEES FOR UNBUNDLED SWITCHING ELEMENTS?

A. The RTU fees for network switch software were computed using a loading factor approach. The loading factor represents the ratio of RTU fee capitalized material price (Field Reporting Code 560C) to switch material price (Field Reporting Code 377C) over the study period. The general procedure for developing the loading factor is as follows:

1) Determine from Company budget forecasts the expected dollar amount for network additions in 377C plant over the study period (2000-2002).

2) Determine from Company budget forecasts the expected dollar amount for network additions in 560C software over the study period (2000-2002).

3) Divide (2) by (1) to compute the RTU fee loading factor.

The RTU Fee loading factor is applied to each UNE switching equipment material price to compute the RTU Fee material price. The RTU Fee material price is passed to the BellSouth Calculator, which converts the material price to cost.

Issue 7: "What are the appropriate assumptions and inputs for the following items to be used in the forward-looking recurring UNE cost studies?

(a) network design (including customer location assumptions);
(b) depreciation;
(c) cost of capital;
(d) tax rates;
(e) structure sharing;
(f) structure costs;
(g) fill factors;

(h) manholes;

(i) fiber cable (material and placement costs);

(j) copper cable (material and placement costs);

(k) drops;

(l) network interface devices;

(m) digital loop carrier costs;

(n) terminal costs;

(o) switching costs and associated variables;

(p) traffic data;

(q) signaling system costs;

(r) transport system costs and associated variables;

(s) loadings;

(t) expenses;

(u) common costs;

(v) other. "

Q. TO WHICH OF THE ITEMS ARE YOU RESPONDING?

A. I will discuss items (o) switching costs and associated variables and (p) traffic data. For the purpose of my responses I assume that "traffic data" means data that address the characteristics of line and trunk usage, for example, the number of calls in the switch Busy Hour. I will first discuss the appropriate network design for TELRIC switching cost studies, and then the specific switching cost and traffic data inputs associated with each of the major switching cost modules: SCIS/MO, Exchange Ports, Features, and Switched Usage and Common Transport.

Q. WHAT ARE THE APPROPRIATE NETWORK DESIGN ASSUMPTIONS FOR END OFFICE AND TANDEM SWITCHING?

A. The FCC's First Report and Order stated that TELRIC cost studies should be based on the most efficient available technology using existing wire center locations. BellSouth's TELRIC SCIS/MO studies comply with this principle by assuming all digital switches and by using the latest switch technologies available from SCIS/MO at the time the study was performed. Complexes of host and remote switches are used where applicable to create the most efficient possible integrated network. The FCC has affirmed that the ILECs' existing host/remote relationships, as identified in the Telcordia Technologies Local Exchange Routing Guide (LERG), represent the most efficient and cost-effective switch network configuration available.[1]

A second major element of efficient network design is loop technology. While the switching studies do not include loops, they must be designed to be compatible with the most economically efficient loop designs. BellSouth's switching cost studies use integrated digital loop carrier (IDLC) equipment in the same proportions as BellSouth's loop studies.

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[1] In the Matter of Federal-State Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECS, Tenth Report and Order, October 21, 1999, at para. 323.

Q. WHAT DID BELLSOUTH DO IN THE CASE WHERE EXISTING WIRE CENTER LOCATIONS CONTAIN ANALOG SWITCHES?

A. Based on BellSouth Network Planning information and engineering judgment the SCIS/MO analyst selected a digital switch to replace each existing analog switch.

Q. WHAT ARE THE MOST IMPORTANT ASSUMPTIONS AND INPUTS FOR THE SCIS/MO FUNDAMENTAL STUDY?

A. While the SCIS/MO studies require a large number of individual inputs for each wire center, the most important are:

- Type of line terminations used,
- Type of trunk terminations used,
- Vendor discounts,
- Type of switch processor equipment used, and
- Usage characteristic inputs.

Q. HOW DOES THE SCIS/MO PROCESS INCORPORATE INTEGRATED DIGITAL LOOP CARRIER?

A. The version of SCIS/MO used in the study (2.6.1) uses GR303 terminations exclusively, where available, for exchange ports on the Lucent and NORTEL switches[2]. The model provides GR303 material prices for both "Plain Old Telephone Service" (POTS) and 2-wire ISDN lines. From the BellSouth Telecommunications Loop Model© (BSTLM), we obtained by wire center the percent of switched local exchange lines terminated on Digital Loop Carrier (DLC). This percentage was used to compute the number of Digital lines and the number of Analog lines terminated on each switch.

Q. WHAT TYPES OF VENDOR DISCOUNTS DID BELLSOUTH USE IN THE SCIS/MO STUDIES?

A. BellSouth typically experiences two levels of discounts when purchasing central office switch equipment. The first, which I shall call the "replacement" discount, is the discount level that BellSouth typically receives when purchasing an entire central office switch, including the core "getting started" components of the switch and enough line and trunk equipment to satisfy demand over the engineering planning horizon[3]. Usually this purchase is made to replace an older analog switch with a new digital switch, and BellSouth receives relatively larger discounts from the vendors as an incentive to do such replacements.

The second type of discount, which I shall call the "growth" discount, applies

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[2] GR303 terminations are not currently available on NORTEL remote switches. The BellSouth SCIS/MO study therefore uses TR-008 digital terminations for NORTEL remotes.

[3] BellSouth's planning horizon for switching is typically 2 to 3 years.

when BellSouth is purchasing equipment to increase the capacity of an existing digital switch. This discount is significantly lower than the promotional replacement discounts. The majority of BellSouth's forward-looking switching equipment expenditures are for growth jobs.

Q. HOW WERE THE SWITCH DISCOUNTS USED IN THIS SCIS/MO STUDY DETERMINED?

A. Growth discounts are stated in BellSouth's contracts with the switch vendors. Replacement discounts were derived as follows:

1) Actual orders for replacement offices were used to determine the appropriate switch engineering inputs into SCIS/MO Release 2.6.1. SCIS/MO was run using a zero discount to obtain the non-discounted list price for the equipment.

2) Actual billing for the above replacement orders was obtained from accounting records. The actual billing was then compared to the SCIS/MO non-discounted runs to determine the actual discount received.

3) The entire set of offices was input into SCIS/MO and the discount rate was manually adjusted, using an iterative process, until the discounted pricing from SCIS/MO approximated the actual billing shown in the accounting records for the set of offices.

This replacement discount was applied to all components in SCIS/MO labeled as "getting started" material prices. For the SCIS material price categories that grow over time, such as Line Termination material prices, BellSouth applied a melded discount. The meld was developed using the growth discounts as stated in our switch vendor contracts and the replacement discount as determined above. Those discounts were weighted based on line counts being added under each discount.

Q. SOME PARTIES HAVE ADVOCATED THE USE OF REPLACEMENT-ONLY DISCOUNTS FOR SWITCHING, CLAIMING THAT TELRIC PRINCIPALS CALL FOR REPLACEMENT-ONLY DISCOUNTS. WHY DOES BELLSOUTH USE A COMBINATION OF REPLACEMENT AND GROWTH DISCOUNTS IN THE SCIS/MO STUDIES?

A. Parties calling for replacement-only discounts are advocating a scenario that is purely hypothetical and would in reality result in higher costs. The FCC, in formulating the TELRIC rules, clearly intended for ILECs to use the costs that they may reasonably expect to incur in providing network elements to new entrants on a going-forward basis.[4] The only way that BellSouth could effect a replacement-only discount for all the lines on a switch is to purchase enough lines at replacement time to support the demand over the life of the switch. This clearly would violate efficient provisioning practices by creating

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[4] In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, First Report and Order, August 8, 1996, para. 685.

large amounts of excess unused capacity in the switch. Using a replacement-only discount in effect creates a short-run cost study, not a long-run cost study, as TELRIC requires.

The irony of the replacement-only discount approach is that it can actually create a higher material price in the long run than the correct blended approach. Exhibit JHP-1 clearly illustrates the effect that the replacement-only assumption has upon long-run costs. In this example, the replacement-only scenario results in a material price that is $468,899 *higher* over the life of the switch.

Use of the replacement-only discount will produce a higher cost because you would also have to adjust utilization factors downward to account for the placement of equipment years before it is actually used to produce revenue. Proponents of the replacement-only assumption conveniently ignore the utilization issue, and apparently would change only the discount input. Putting in a replacement-only discount without adjusting utilization would produce a short run scenario and an unrealistically low cost study result that ignores reality.

Q. WHAT INPUTS ARE IMPORTANT TO THE DEVELOPMENT OF EXCHANGE PORT COSTS?

A. Exchange port costs are driven primarily by the results of the SCIS/MO study, which provides a material price by switch vendor for each type of exchange port (2-Wire, 4-Wire, ISDN, etc.) Another important input to exchange ports is the switch technology mix, that is the proportion of Lucent switches to NORTEL switches for each state.

In general, the input values used for exchange ports have declined because of more efficient switch architecture, increased BellSouth discounts, and in the case of digital line ports, more extensive use of IDLC equipment.

Q. WHAT INPUTS ARE IMPORTANT TO THE DEVELOPMENT OF FEATURE MATERIAL PRICES?

A. The key inputs to feature material prices are switch realtime estimates, customer usage characteristics, and special hardware prices. Switch realtime is measured in terms of milliseconds - how many milliseconds of realtime are consumed each time a feature is used. Customer usage data measures how many times in the Busy Hour an average customer uses a feature.

Q. HOW DO YOU KNOW HOW MUCH PROCESSOR REALTIME EACH FEATURE CONSUMES ON THE SWITCH?

A. For the SST it is assumed that each use of a feature generates approximately the same processor realtime as a call setup. This assumption is supported by examination of the call timings embedded within SCIS/IN.

Our conclusions on processor realtime use for features were also supported by examination of inputs and results provided by a switch vendor's processor engineering tool. This particular tool accepts inputs that describe in great detail the set of features to be implemented on a particular switch. The possible feature set may include residence and business features, Centrex, AMA recording, and Local Number Portability, as well as others. The total feature processor load on the switch is demand-driven. For example, the number of feature-rich Centrex lines on the switch and the average number of feature calls per Centrex line have a significant and easily-observable effect upon the average processor time required to set up a call.

Q. HOW DID BELLSOUTH DEVELOP THE CUSTOMER USAGE INPUTS USED FOR THE FEATURE STUDIES?

A. In order to obtain average usage data, 56 features (over 20% of the unique switch features) were reviewed. These features were analyzed as to which switch resources were required to process the feature call; processor, line, hardware, and/or SS7. Inputs into BellSouth's retail studies (busy hour calls) were then input into a matrix. This allowed the development of an average call demand by type of switch resource required. For example, the average number of busy hour calls for the features that use the switch processor was 1.1. The next step was to consider that the typical end user customer utilizes 4 vertical features from an extensive list. Multiplying the average Busy Hour demand per feature by the 4 features per average user yielded the average busy hour features calls per line input to the SST.

Q. HOW DID YOU DEVELOP THE INPUTS FOR SPECIAL FEATURE HARDWARE?

A. The hardware price study was performed specifically to provide input values to the BellSouth Simplified Switching Tool (SST). For the purposes of the current UNE studies, the SST requires a pair of single values, one for each switch vendor, that represent the average busy hour investment in special hardware, per CCS of use, for a typical mix of hardware found in the central office. The objective was to produce a single cost number, for pricing purposes, which is representative of all major types of switch hardware usage.

The hardware cost worksheet uses a unit cost process consistent with BellSouth's other material price calculators. These calculators take vendor prices for various pieces of equipment and express the prices on a per circuit level. In essence, the process involves (1) determining the appropriate types and quantities of equipment required, (2) utilizing vendor-furnished price lists, (3) applying a discount rate (if applicable), (4) dividing by the capacity of the equipment, and (5) applying a utilization factor. In the case of feature hardware, the relevant unit of capacity is per CCS of usage.

Hardware prices and capacities for the equipment were obtained directly from the switch vendors where possible. In some cases, information was obtained from the Telcordia SCIS/IN model.

Q. WHAT INPUTS ARE IMPORTANT TO THE DEVELOPMENT OF

UNBUNDLED SWITCHING AND COMMON TRANSPORT MATERIAL PRICES?

A. The most important inputs to SST-U (BellSouth's Usage model) include the distribution of calls (intra-office/interoffice split), busy hour-full day ratio, average minutes per call, and average airline miles per call. The outputs from SCIS/MO and the Interoffice Fundamental Study also are important contributors to the development of the usage costs. This data should be BellSouth-specific.

The distribution of calls is important because interoffice calls, which involve two or more switches, have significantly higher costs than intraoffice calls. The BellSouth distribution of calls is obtained from an internal company study that measures calling patterns during the Busy Season of each year.

The Busy Hour to Full Day Ratio is important because it measures the portion of all traffic during the day that occurs in the office Busy Hour. Since Busy Hour traffic is the only relevant traffic for determining switch material prices, this input has a direct bearing on the material price per minute produced by the model. For example, increasing the Busy Hour ratio from 8% to 10% would increase the usage cost per minute by about the same proportion, or 25%. The current Busy Hour ratio was obtained from BellSouth Subscriber Line Usage (SLUs) studies performed in 1999.

The average minutes per call affects the total cost per minute because it is used to prorate the call setup cost per call across minutes. The current minutes per call number was obtained from BellSouth Subscriber Line Usage (SLUs) studies performed in 1999.

The average airline miles per call is used to prorate costs for SS7 call setup functions, which use the interoffice network, to the Common Transport Facilities rate element. This input is based on data obtained from BellSouth's Carrier Access Billing System (CABS).

For detailed descriptions of these and all of the other inputs to the BellSouth Unbundled Local Switching Studies, please see the SST Input Data Dictionary for the Usage and Port Models, which was filed with the BellSouth Cost studies on April 17, 2000.

Q. PLEASE SUMMARIZE YOUR TESTIMONY.

A. BellSouth's switching cost studies for UNEs utilize the appropriate TELRIC methodology. They use the right combination of network design assumptions, material price models, and inputs to develop the costs for an efficient, forward-looking network. As with all of BellSouth's cost studies, these studies use BellSouth-specific inputs to estimate BellSouth's cost of providing unbundled network elements. The studies reflect a general overall decline in BellSouth's switching prices over the past several years.

With this cost study BellSouth introduces a new model, the SST, which produces forward-looking material prices for Exchange Ports, Features, and Switched Usage and Common Transport. The SST was designed to be streamlined, understandable, open, and non-proprietary, while still producing accurate, forward-looking cost studies.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Central Office Switching
Comparison of Replacement Discount and Growth Discount Assumptions

Assume:

Life of Switch:	10	Years
Replacement Discount:	40%	
Growth Discount:	25%	
Growth Interval:	2	Years
Cost of Money:	11.25%	
"Getting Started" Investment	$2,000,000	List Price
Investment per Line	$200	List Price
Initial Demand	10,000	Lines
Annual Growth Rate	10%	percent

Calculations:

	Total	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Year		0	1	2	3	4	5	6	7	8	9	10
Beginning of Year Demand		10,000	11,000	12,100	13,310	14,641	16,105	17,716	19,488	21,437	23,581	25,939
Replacement + Growth Discount Assumption:												
The switch is grown at 2-year intervals to meet demand. Growth lines have a lower vendor discount than lines purchased with switch replacement.												
Lines Purchased	26,000	12,100		2,600		3,100		3,700		4,500		
Total Lines Available		12,100	12,100	14,700	14,700	17,800	17,800	21,500	21,500	26,000	26,000	26,000
CAPEX	$4,737,000	$2,652,000		$390,000		$465,000		$555,000		$675,000		
Present Value of CAPEX	**$3,851,101**	$2,652,000		$315,112		$303,566		$292,747		$287,676		
"All Replacement" Discount Assumption:												
The initial purchase includes enough lines to support growth over the life of the switch. This is done to obtain the higher "replacement" discount on all lines.												
Lines Purchased	26,000	26,000										
Total Lines in Service		26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000
CAPEX	$4,320,000	$4,320,000										
Present Value of CAPEX	**$4,320,000**	$4,320,000										

Difference:

Replacement & Growth Discounts	$3,851,101
"All Replacement" Discount	$4,320,000
Difference	**-$468,899**

CAPEX - capital expenditures

Note: For simplicity, this analysis ignores adminstrative fill factors and ordering intervals and assumes that lines can be purchased in blocks of 100.

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