BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Metropolitan Fiber Systems of Florida, Inc. for arbitration with BellSouth Telecommunications, Inc. concerning interconnection rates, terms, and conditions, pursuant to the Federal Telecommunications Act of 1996.	DOCKET NO. 960757-TP
In re: Petition by AT&T Communications of the Southern States, Inc. for arbitration of certain terms and conditions of a proposed agreement with BellSouth Telecommunications, Inc. concerning interconnection and resale under the Telecommunications Act of 1996.	DOCKET NO. 960833-TP
In re: Petition by MCI Telecommunications Corporation and MCI Metro Access Transmission Services, Inc. for arbitration of certain terms and conditions of a proposed agreement with BellSouth Telecommunications, Inc. concerning interconnection and resale under the Telecommunications Act of 1996.	DOCKET NO. 960846-TP ORDER NO. PSC-98-0604-FOF-TP ISSUED: April 29, 1998

The following Commissioners participated in the disposition of this matter:

JULIA L. JOHNSON, Chairman
J. TERRY DEASON
SUSAN F. CLARK
JOE GARCIA
E. LEON JACOBS, JR.

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FINAL ORDER ON ARBITRATION

BY THE COMMISSION:

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ACRONYMS AND ABBREVIATIONS

ACAC	Access Customer Advocacy Center
Act	Communications Act of 1934 as amended by the Telecommunications Act of 1996, 47 U.S.C. §1 et seq.
ACSI	American Communications Services, Inc., American Communications Services of Jacksonville Inc.
ADSL	Asymmetrical Digital Subscriber Line
AIN	Advanced Intelligent Network
ACSI	American Communications Services, Inc./American Communications Services, Inc., of Jacksonville
AFIG	Assignment Facilities Inventory Group
AT&T	AT&T Communications of the Southern States, Inc.
ARMIS	Automated Report Management Information System
BDFB	Battery distribution fuse bay
BOC	Bell Operating Companies
BellSouth	BellSouth Telecommunications, Inc.
CABS	Carrier Access Billing System
CAM	Cost Allocation Manual
CAPM	Capital Asset Pricing Model
CBG	Census Block Group
CGI	Common Gateway Interface

CLEC	Competitive Local Exchange Carrier
CO	Central Office
CPG	Circuit Provisioning Group
COSMOS	Computer System for Mainframe Operations
DAML	Digital Additional Main Line
DCF	Discounted Cash Flow
DCS	Digital cross-connect system
DDM	Dividend Discount Models
DLR	Design Layout Record
DIP	Dedicated Inside Plant
DOP	Dedicated Outside Plant
DA	Directory Assistance
DLC	Digital Loop Carrier
DOE	Direct Order Entry
DSX	Digital signal cross-connect
Eighth Circuit	U.S. Court of Appeals, 8th Circuit
EDI	Electronic Data Interchange
EF&I	Engineered, Furnished and Installed (Cost)
EXACT	Exchange Access Control and Tracking System
FCC	Federal Communications Commission
FRN	Facility Record Number
FDI	Feeder Distribution Interface
FOC	Firm Order Confirmation

GNP	Gross National Product
HDSL	High-Bit Rate Digital Subscriber Line
HVAC	Heating, Ventilation, and Air Conditioning
IBES	Institutional Brokers' Estimate Service
ICB	Individual Case Basis
I&M	Installation & Maintenance
ICI	Intermedia Communications of Florida, Inc.
ILEC	Incumbent Local Exchange Carrier
ISDN	Integrated Services Digital Network
Intermedia	Intermedia Communications, Inc.
IXC	Interexchange Carrier
LCSC	Local Carrier Service Center
LENS	Local Exchange Navigation System
LEO	Local Exchange Ordering
LESOG	Local Exchange Service Order Generator
LFAC	Loop Facilities Assignment Center
LRIC	Long Run Incremental Cost
M/B	Market-to-Book
MCI	MCI Metro Access Transmission Services, Inc. & MCI Telecommunications Corporation
MDF	Main distribution frame

MFS	Metropolitan Fiber Systems of Florida, Inc.
NRCM	Non-recurring Cost Model
OSP	Outside Plant
OSS	Operations Support Systems
PE	Price-Earnings Ratio
PIC	Primary Interexchange Carrier Change
POT	Point of Termination
RCMAG	Recent Change Memory Administration Group
RBHC	Regional Bell Holding Company
RBOC	Regional Bell Operating Company
RNS	Regional Negotiation System
RRR	Residual Recovery Requirement
S&P	Standard & Poor's
SCIS	Switching Cost Information System
SSIM	Special Services Installation & Maintenance
SONET	Synchronous Optical Network
SONGS	Service Order Negotiation System
Sprint	Sprint Communications Company Limited Partnership/Sprint Metropolitan Network, Inc.
TAFI	Trouble Analysis Facilitation Interface
TCG	TCG of South Florida

Time Warner	Time Warner AxS of Florida, L.P.
TELRIC	Total Element Long Run Incremental Cost
Time Warner	Time Warner AxS of Florida, L.P./Time Warner Connect
TIRKS	Trunk Information Record Keeping System
TPI	Telephone Plant Index
TSLRIC	Total Service Long Run Incremental Cost
UNE	Unbundled Network Element
USOA	Uniform Systems of Accounts
xDSL	All types of Digital Subscriber Line loops, e.g., ADSL & HDSL
YTM	Yield-to-Maturity

I. BACKGROUND

On December 16, 1996, we issued Order No. PSC-96-1531-FOF-TP, in Docket No. 960757-TP: In that order, which involved Metropolitan Fiber Systems of Florida, Inc. (MFS) and BellSouth Telecommunications, Inc. (Bellsouth), we ordered BellSouth to file cost studies so that permanent rates could be established for specific unbundled network elements. On December 31, 1996, we issued Order No. PSC-96-1579-FOF-TP in Docket Nos. 960833-TP and 960846-TP. In that order, which involved BellSouth, AT&T Communications of the Southern States, Inc. (AT&T) and MCI Telecommunications, Inc. and MCImetro Access Transmission Services, Inc. (MCI), we again ordered BellSouth to file cost studies specifically on those elements for which we had established interim rates so that permanent rates could be established.

Section 252(g) of the Telecommunications Act of 1996 (Act) provides that a state commission may, to the extent practical, consolidate proceedings under sections 214(e), 251(f), 253 and 252 to reduce administrative burdens on telecommunications carriers, other parties to the proceedings, and the state commission in carrying out its responsibilities under the Act. Thus, Docket Nos. 960833-TP, 960846-TP, and 960757-TP were consolidated and set for hearing.

On October 3, 1997, MFS filed a request to include issues in this proceeding regarding geographically deaveraged loops. By Order No. PSC-97-1303-PCO-TP, issued October 21, 1997, MFS's request was denied.

By Order No. PSC-97-1399-PCO-TP, issued November 6, 1997, American Communications Services, Inc./American Communications Services, Inc., of Jacksonville (ACSI) was granted intervention in this proceeding. Following that order, Intermedia Communications, Inc., (Intermedia), Time Warner AxS of Florida, L.P. (Time Warner), and Sprint Communications Company Limited Partnership/Sprint Metropolitan Network, Inc. (Sprint), respectively, filed petitions to intervene. By Order No. PSC-98-0007-PCO-TP, issued January 2, 1998, the prehearing officer reversed Order No. PSC-97-1399-PCO-TP. On that same day, the prehearing officer issued Order No. PSC-98-0008-PCO-TP denying the respective intervention petitions of Intermedia, Time Warner and Sprint. ACSI, Sprint, Time Warner and Intermedia then filed petitions for reconsideration which were denied by the full Commission.

On January 26 through January 28, 1998, we conducted an evidentiary hearing for these consolidated dockets. Having considered the evidence presented at hearing, the posthearing briefs of the parties, and the recommendations of our staff, our arbitration decisions are set forth below.

II. INTRODUCTION

The objective in these proceedings was to establish recurring and non-recurring rates for certain unbundled network elements (UNEs). We determined that decisions on certain inputs (common matters) directly affect cost development for all the UNEs considered in these proceedings. Accordingly, we discuss in Part III first a number of common matters as follows:

A. Cost of Capital;
B. Depreciation;
C. Tax Factors;
D. Shared and Common Costs;
E. Residual Revenue Requirement;
F. Non-Recurring costs Disconnect Factor.

We then discuss in Part IV the specific UNEs in issue in these proceedings as follows:

A. Network Interface Device (NID);
B. 2-wire and 4-wire loop distribution;
C. 2-wire ADSL-compatible loop;
D. 2-wire and 4-wire HDSL-compatible loop;
E. Physical collocation;
F. Virtual collocation;
G. Directory Assistance and Dedicated Transport (non-recurring only); and
H. 4-wire analog port.

Pursuant to Order No. PSC-96-1579-FOF-TP, on November 13, 1997, BellSouth filed its Total Element Long-run Incremental Cost (TELRIC) Calculator, its model that determines the recurring and non-recurring economic costs associated with a particular unbundled network element. While the model has been named the TELRIC Calculator, it can also develop TSLRIC outputs based on the user's inputs because the model is flexible. The TELRIC Calculator can be used to produce TSLRIC studies by eliminating the shared and common costs from the calculation. Thus, the TELRIC economic costs equal the TSLRIC costs plus shared and common costs.

The TELRIC Calculator uses the outputs from several other models and price calculators as inputs in determining the cost associated with a UNE. The basic models used by BellSouth include: (1) the Capital Cost Calculator; (2) the Loop Model; (3) the Switching Cost Information System (SCIS) model; and (4) the Shared and Common Cost Model. The Capital Cost Calculator produces depreciation, cost of money, and income tax factors which are applied to investments to calculate the capital costs. The Loop Model is used to develop the material costs for narrowband loop and loop-related UNEs. The SCIS Model is used in this proceeding to produce switch-related costs associated with ports and features. The Shared and Common Cost Model determines the level of shared and common costs attributable to the UNEs.

BellSouth also used three price calculators in conjunction with the basic models listed above: (1) the Synchronous Optical Network (SONET) Price Calculator; (2) the Loop Multiplexer Price Calculator; and (3) the Digital Loop Carrier (DLC) Price calculator. These price calculators develop the material cost of specialized components that are used in the provision of various UNEs. AT&T proposed a non-recurring cost model and a collocation model to determine the cost of certain UNEs. Witness Caldwell sponsors the BellSouth cost studies. Witness Lynott sponsors AT&T/MCI's non-recurring cost studies and Witnesses Klick and Bissell sponsor its collocation cost studies. The models proposed by BellSouth and AT&T to determine the costs associated with a particular UNE are discussed in detail below.

Upon consideration, and based upon the evidence in the record for these proceedings, we hereby establish recurring rates for the network elements at issue as shown in Table I. We also establish non-recurring rates for those elements as shown in Table II. These rates cover BellSouth's Total System Long-run Incremental Costs (TSLRIC) and provide some contribution toward joint and common costs.

TABLE I
Approved Recurring UNE Rates

RECURRING RATES	NETWORK ELEMENTS
Network Interface Device	$1.08
2-wire Analog Loop Distribution	$8.57

RECURRING RATES	**NETWORK ELEMENTS**
4-wire Analog Loop Distribution	$11.29
2-wire ADSL Loop	$15.81
2-wire HDSL Loop	$12.12
4-wire HDSL Loop	$18.24
4-wire Analog Port	$9.14
Local Channel DS-1	$44.35
DS-1 Interoffice per Mile	$0.6013
DS-1 Facility Termination	$101.61
Physical Collocation	
Application Fee	$15.53
Space Preparation	not applicable
Space Construction-per 100 sq. ft. Wire Cage Gypsum Cage Fire Rated Cage Space Construction-per additional 50 sq. ft. Wire Cage Gypsum Cage Fire Rated Cage	 $41.99 $84.10 $99.73 $4.14 $9.35 $11.30
Floor Space - per sq. ft.	$4.25
Cable-Installation, per cable Cable Rack	$2.77 $22.94
Power, per Ampere	$6.95

RECURRING RATES	NETWORK ELEMENTS
Cross Connects,	
2-wire, per 100 circuits	$5.24
4-wire, per 100 circuits	$5.24
DS-1-DCS, per 28 circuits	$226.39
DS-1-DSX, per 28 circuits	$11.51
DS-3-DCS, per circuit	$56.97
DS-3-DSX, per circuit	$10.06
Optical circuits per connection	$6.46
Virtual Collocation	
Floor Space-per sq. ft.	$4.25
Cable-Installation, per cable	$12.45
Cable Rack Per 1/4 Rack	$2.24
Power, per Ampere	$6.95
Cross Connects,	
2-wire, per 100 circuits	$5.02
4-wire, per 100 circuits	$5.02
DS-1-DCS, per 28 circuits	$226.39
DS-1-DSX, per 28 circuits	$11.51
DS-3-DCS, per circuit	$56.97
DS-3-DSX, per circuit	$10.06
Optical circuits per connection	$6.71
Virtual to Virtual Connection	
Fiber per cable	$.19
DS-1/DS-3 per cable	$.17

TABLE II
Approved Non-recurring UNE Rates

NETWORK ELEMENT	NON-RECURRING RATES	
	First	Additional
Installation of 2-wire/4-wire ALEC NID	$70.32	$54.35
Cross Connect, 2-wire or 4-wire	$6.15	$6.15

NETWORK ELEMENT	NON-RECURRING RATES First	Additional
2-wire Analog Loop Distribution	$78.29	$58.33
4-wire Analog Loop Distribution	$112.07	$92.11
2-wire ADSL Loop	$113.85	$99.61
2-wire HDSL Loop	$113.85	$99.61
4-wire HDSL Loop	$116.91	$101.71
4-wire Analog Port	$5.86	$5.86
DS-1 Facility Termination	$45.91	$44.18
Local Channel DS-1	$246.50	$230.49
Installation per trunk or signaling connection	$332.42	$8.82
Physical Collocation		
Application Fee	$3,248.00	
Space Preparation	ICB	
Cable -Installation, per cable	$1,056.00	
Cross Connects, 2-wire, per 100 circuits 4-wire, per 100 circuits DS-1-DCS, per 28 circuits DS-1-DSX, per 28 circuits DS-3-DCS, per circuit DS-3-DSX, per circuit Optical circuits, per connection	 $1,157.00 $1,157.00 $1,950.00 $1,950.00 $528.00 $528.00 $2,431.00	
Security Escort Regular Time per 1/4 Hour Overtime per 1/4 Hour Premium Time per 1/4 Hour Cards - per 5 cards	 $10.89 $13.64 $16.40 $85.12	
Virtual Collocation		

NETWORK ELEMENT	NON-RECURRING RATES First	Additional
Application Fee:		
Initial Request	$4,122.00	
Additional Cable Request	$1,249.00	
Cable-Installation, per cable	$965.00	
Cross Connects,		
2-wire, per 100 circuits	$1,157.00	
4-wire, per 100 circuits	$1,157.00	
DS-1-DCS, per 28 circuits	$1,950.00	
DS-1-DSX, per 28 circuits	$1,950.00	
DS-3-DCS, per circuit	$528.00	
DS-3-DSX, per circuit	$528.00	
Optical circuits per connection	$2,431.00	
Virtual to Virtual Connection		
Fiber per cable	$526.17	
DS-1/DS-3 per cable	$134.46	
Security Escort & Equipment Maintenance		
Regular Time per 1/4 Hour	$10.89	
Overtime per 1/4 Hour	$13.64	
Premium Time per 1/4 Hour	$16.40	

III. COMMON MATTERS

A. Cost of Capital

The Act requires all incumbent local exchange carriers (ILECs), including the Regional Bell Operating Companies (RBOCs) such as BellSouth, to provide interconnection and unbundled network elements to requesting competitive local exchange carriers (CLECs). Section 251 of the Act requires that the provision of these services and elements must be rendered on rates, terms, and conditions that are just, reasonable, and non-discriminatory. With respect to the rates charged by ILECs to CLECs, Section 252 requires state commissions to determine the just and reasonable

rates for interconnection and network elements on the basis of the cost of providing these services, determined without reference to a rate-of-return or other rate-based proceeding. 47 U.S.C. § 251(c)(2), §(c)(3), and § 252(d).

As the witnesses appearing in these proceedings have interpreted these provisions, the Act expressly prohibits the use of the traditional rate of return on rate base methodology as the cost standard for UNEs. This means that familiar costing concepts in public utility regulation, such as embedded costs and fully-allocated costs, cannot be applied in determining the just, reasonable, and non-discriminatory rates that CLECs should pay for the services and UNEs purchased from ILECs. Thus, in light of those prohibitions, the witnesses testify that the Act implicitly endorses the use of marginal or incremental costs as the pricing standard for setting, among other rates, the appropriate cost of capital in the pricing of UNEs.

Two witnesses filed testimony in these proceedings regarding the appropriate forward-looking economic cost of capital for BellSouth for the provisioning of UNEs. Witness Billingsley, appearing on behalf of BellSouth, does not recommend a specific cost of capital but instead testifies that BellSouth's use of an 11.25 per cent cost of capital in its cost study was reasonable and conservative. Witness Cornell, appearing on behalf of AT&T and MCI, testifies that the midpoint of the cost of capital range for BellSouth of 9.43 per cent was a conservative estimate of the cost of capital that should be used in these proceedings.

To determine the appropriate forward-looking cost of capital to be included in the prices for UNEs, we find that it is necessary to estimate the forward-looking cost of debt and equity for BellSouth. In addition, it is necessary to determine the appropriate mix of debt and equity in the capital structure. Combining these inputs produces the cost of capital estimates endorsed by the respective witnesses.

Capital Structure

In its cost study, BellSouth assumes a capital structure of 60 per cent equity and 40 per cent debt. Witness Billingsley relies upon this relative level of capitalization in his determination of the reasonableness of the overall cost of capital of 11.25 per cent used by BellSouth in its cost study.

AT&T/MCI witness Cornell considers the average capital structures of his index of comparable companies to determine the appropriate capital structure for BellSouth. His index includes the Regional Bell Holding Companies (RBHCs) and the larger independent telephone companies. On a book value basis, he finds the average capitalization for his index to be 44 per cent equity and 56 per cent debt. On a market value basis, he finds the average to be 76 per cent equity and 24 per cent debt. In employing both the book value and market value averages to establish his range for the weighted average cost of capital for BellSouth, witness Cornell implicitly assumes an average capital structure of 60 per cent equity and 40 per cent debt in arriving at his recommended overall cost of capital of 9.43 per cent.

The exhibits in the record show that over the last four years, the actual equity ratio for BellSouth has varied from a high of 59.9 per cent in 1994 to a low of 56.6 per cent in 1995. The most recent equity ratio available was 58.8 per cent for the period through the third quarter of 1997. We have strong reservations whether this level of equity capitalization is truly necessary given witness Cornell's testimony that the leasing of UNEs is one of the least risky businesses engaged in by the RBHCs. However, since both witnesses employ the same relative percentages of equity and debt in their analyses, we will recognize a capital structure of 60 per cent equity and 40 per cent debt in determining the appropriate weighted average cost of capital for purposes of these proceedings.

Cost of Debt

In its cost study, BellSouth assumes a cost of debt of 8.00 per cent. There is no evidence in this record to support this cost rate. Witness Billingsley testifies that the forward-looking cost of debt for BellSouth is 7.25 per cent. He arrives at this rate by adding the average spread between the yields on AAA-rated public utility bonds and 30-year Treasury bonds from October 1987 through October 1997 of .79 per cent to the yield-to-maturity (YTM) on 30-year Treasury bonds for the period August 1997 to October 1997 of 6.47 per cent. Finally, BellSouth estimates that its marginal cost of debt is approximately 7.10 per cent. This estimate is based upon the three-month (September to November 1997) average yield on 30-year Treasury bonds of 6.31 per cent plus a risk premium of .80 per cent. The risk premium is the average spread between the yield on AAA-rated public utility bonds versus the 30-year Treasury bond from October 1987 through November 1997.

Witness Cornell assumes a cost of debt of 7.06 per cent. He arrives at this rate by calculating the YTM as of December 31, 1996, of all of BellSouth's outstanding debt issues, including the debt of the holding company and any subsidiaries. However, updating his analysis through December 31, 1997, he calculates the YTM for BellSouth of 6.65 per cent. He testifies that the YTM is a forward-looking cost of debt that measures the rate BellSouth would have to pay if the bonds were issued at the measurement date, and reflects investors' expectations regarding the future returns on these publicly-traded bonds.

The exhibits in the record show that BellSouth's embedded cost of debt through the third quarter of 1997 was 6.44 per cent. However, because there is a debate whether embedded costs can be used for setting prices in these proceedings, this rate is noted only as a point of reference. Using the methodology employed by BellSouth for estimating its marginal cost of debt, but updating the inputs through December 31, 1997, BellSouth's forward-looking cost of debt is 6.91 per cent. Using the methodology advocated by BellSouth, we determine this rate by adding the three month (October to December 1997) average yield on 30-year Treasury bonds of 6.12 per cent and a risk premium of .79 per cent to account for the average difference between the yields on AAA-rated public utility bonds and 30-year Treasury bonds (October 1987 to December 1997). The 6.91 per cent rate, however, only reflects the cost of long-term debt. Witness Cornell testifies that network assets have varied expected economic lives, not all of which are necessarily long-term. Moreover, the network element leasing business, like any other business, would be financed with a variety of sources and maturities. Witness Billingsley concedes that BellSouth employs short-term debt in its capital structure and will continue to do so on a going forward basis. Through the third quarter of 1997, approximately 14 per cent of BellSouth's total debt was in the form of commercial paper. The exhibits in the record demonstrate that BellSouth's commercial paper program is projected not to exceed 17 per cent of total debt on a going forward basis. Through the third quarter of 1997, BellSouth's average cost rate for commercial paper is 5.50 per cent. We find that assuming a cost rate of 5.50 per cent for commercial paper is conservative since interest rates have come down since the end of the third quarter of 1997. Based on the evidence submitted, we assume a conservative mix of 85 per cent long-term debt at a cost rate of 6.91 per cent and 15 per cent short-term debt at a cost rate of 5.50 per cent. Therefore, we find that the forward-looking total cost of debt for BellSouth's provision of unbundled network elements is 6.70 per cent.

We believe that a 6.70 per cent cost of debt is a conservatively high estimate of BellSouth's true forward-looking cost of debt. This rate is very close to the current YTM as of December 31, 1997, for BellSouth's total debt issues calculated by witness Cornell of 6.68 per cent, excluding the two securities issued by BellSouth Capital Funding. This rate is above the current embedded total cost of debt for BellSouth of 6.44 per cent. The 6.70 per cent rate exceeds the average yield on 30-year Treasury bonds for December 1997 of 5.96 per cent by 74 basis points. Finally, the exhibits in the records show that while the average yield for the index of AAA-rated public utility bonds exceeded the yield on 30-year Treasury bonds on average by approximately 79 basis points over the last 10 years, over the last 4 years BellSouth's actual experience has been a spread of only 39 basis points on average over the yield on 30-year Treasury bonds. Based on this, one could argue that BellSouth's actual experience indicates its true forward-looking cost of long-term debt is only 6.51 per cent. To be conservative, we adopt the indicated 6.91 per cent cost rate for long-term debt in estimating BellSouth's total cost of debt. Upon consideration, we authorize a cost of debt of 6.70 per cent for purposes of determining BellSouth's forward-looking cost of capital in these proceedings.

Cost of Equity

BellSouth witness Billingsley uses three models to estimate the cost of equity of BellSouth. Since BellSouth is a subsidiary of BellSouth Corporation, it does not have equity traded in the market. Thus, there is no direct market information upon which to estimate BellSouth's cost of equity capital. Therefore, it is necessary for witness Billingsley to infer BellSouth's cost of equity by evaluating the available market data for publicly traded companies comparable in risk to BellSouth. In his first approach, witness Billingsley applies the DCF model to a group of firms he identifies as comparable in risk to BellSouth. In his second approach, he uses the CAPM. Finally, he conducts a risk premium analysis. From these analyses, he concludes that the current cost of equity capital for BellSouth is within the range of 14.72 per cent to 15.20 per cent.

Witness Billingsley uses the constant growth or single-stage form of the DCF model which assumes growth remains constant over an indefinite or infinite holding period. The growth rates he uses in this analysis are the five-year earnings growth rates forecasted by Institutional Brokers' Estimate Service (IBES) and Zacks Investment Research, Inc. His DCF model includes an adjustment of 5 per cent for the recovery of flotation costs and recognizes the quarterly compounding of dividends. He applies this form of the DCF model to an index of companies he identifies as comparable in risk to BellSouth. Witness Billingsley uses a cluster analysis to identify his index of 20 firms. Based upon his DCF analysis, he concludes that the cost of equity for BellSouth is in the range of 15.11 per cent to 15.20 per cent.

AT&T/MCI witness Cornell relies upon two models for estimating the cost of equity for BellSouth. For the same reasons witness Billingsley cites, witness Cornell has to rely on market data of publicly traded companies to estimate the cost of equity capital of BellSouth. In his first approach, witness Cornell applies the Discounted Cash Flow (DCF) model to a group of companies he identifies as comparable in risk to BellSouth. In his second approach, he uses the Capital Asset Pricing Model (CAPM). These two models produce a range of estimates of the cost of equity capital from 10.99 per cent to 11.05 per cent. He assumes the midpoint of this range of 11.02 per cent as the appropriate cost of equity for BellSouth.

Witness Cornell uses the variable growth or three stage form of the DCF model which distinguishes between short and long-term growth rate projections. He assumes the first stage lasts five years because that is the longest horizon over which analysts' forecasts of growth are available. For this period, he uses the five-year earnings growth rates forecasted by IBES. He assumes the second stage lasts 15 years during which the growth rate falls from the high level of the first five years to the growth rate of the U.S. economy by the end of year 20. From the twentieth year onward he sets the growth rate equal to the growth rate of the economy because he believes rates greater than that cannot be sustained into perpetuity. The long-term growth forecast used after year 20 was derived by averaging the long-term Gross National Product (GNP) growth forecasts obtained from the Wharton Econometric Forecasting Associates and from Ibbotson Associates. Witness Cornell uses the annual form of the DCF model. His model does not include an adjustment for flotation costs. He applies this form of the DCF model to an index of companies he identified as comparable in risk to BellSouth. Witness Cornell selects the RBHCs and larger

independent telephone companies from the telephone operating companies listed in S&P's Industry Survey. Based upon his DCF analysis, he concludes that the cost of equity for BellSouth is in the range of 10.74 per cent to 11.07 per cent.

In contrast, witness Cornell points out that the only support witness Billingsley cites for the application of the constant growth DCF model using short-term growth forecasts is that this method is often used in traditional rate regulation, with the telephone business highly regulated and stable. Moreover, he states that it appears far more reasonable that the true estimate of BellSouth's cost of equity is produced by a DCF analysis that assumes a growth rate of 8.7 per cent for the first five years and decreases in a linear manner to a long-run sustainable rate of 6.2 per cent by year 20, than the estimate produced by a DCF analysis that assumes the growth rate will remain constant at 13.0 per cent forever. This is particularly true in light of BellSouth's forecasted growth rate over the next five years of 8.4 per cent.

We recognize the results of both the quarterly and the annual form of the DCF model, preferred, respectively, by witness Billingsley and witness Cornell. For example, the estimates indicated by witness Billingsley's adjusted CAPM and risk premium analyses recognize the quarterly compounding of dividends and the estimates indicated by witness Cornell's adjusted DCF and CAPM analyses do not. Based upon witness Billingsley's testimony, however, the difference between the DCF estimates using the quarterly model versus the annual model is negligible.

Upon consideration, we find that the multi-stage DCF model employed by AT&T/MCI witness Cornell is superior to the single-stage DCF model used by BellSouth witness Billingsley for estimating the cost of equity capital of BellSouth. Witness Cornell testifies that the form of the DCF model he uses is well supported in the financial community. He notes that prominent economists familiar with cost of capital research have recognized that the simple perpetual growth DCF model using short-term forecasts is inappropriate to use if a company's short-term growth rate is expected to exceed the long-term growth of the economy. We also find that an adjustment is appropriate to allow the recovery of flotation costs. Based upon witness Cornell's DCF analysis, the average of the difference between including and excluding a 5 per cent adjustment for flotation costs is approximately 24 basis points. Adding this adjustment to the estimate indicated by witness Cornell's DCF analysis results in a revised estimate of the cost of equity for BellSouth of 11.25 per cent.

We have strong reservations regarding witness Billingsley's testimony that his index is more comparable in risk to BellSouth than witness Cornell's index. Witness Cornell testifies that "if one were to accept the results of [witness Billingsley's] cluster analysis, then one would have to believe that the risk of the network leasing business was more similar to the risks faced by Coca Cola, McDonalds and Wal-Mart stores, as examples, than to the risks faced by BellSouth's parent company, BellSouth (which owns LECs and the underlying network elements)." Witness Cornell also testifies that by selecting a group of companies with growth rates that exceed a reasonable forecast of the aggregate economy and assuming that these growth rates will remain constant into perpetuity, witness Billingsley "systematically guarantees an inaccurately high cost of equity estimate inconsistent with investor expectations."

Although witness Billingsley claims he proves that his index is comparable in risk to BellSouth and that the index of RBHCs and selected independent telephone companies used by witness Cornell's is not, a detailed comparison of the two indices does not bear this out. We compare the averages of several key measures of investment risk for each index provided by each witness as of December 31, 1996. The first measure is the market-to-book (M/B) ratio for each index. The average M/B ratio for witness Billingsley's index is 6.0. The average M/B ratio for witness Cornell's index is 4.5. The average M/B ratio for BellSouth for the same period is 3.0. Witness Billingsley acknowledges that investment risk can be measured by the relative M/B ratio of the firm.

The second measure is the average price-earnings (PE) ratio. For witness Billingsley's index, it is 22.5. For witness Cornell's index, it is 15.8. The PE ratio for BellSouth for the same period was 14.1. Witness Billingsley acknowledges that investment risk can be measured by the relative PE ratio of the firm.

The third measure is the average BARRA beta. The average BARRA beta for witness Billingsley's index is 0.90. The average BARRA beta for witness Cornell's index is 0.72. The BARRA beta for BellSouth for the same period was 0.72.

The fourth measure is the average of the Institutional Brokers' Estimate Service (IBES) five-year growth rate projections. For witness Billingsley's index, it is 13.02 per cent. For witness Cornell's index, it is 8.73 per cent. The five-year IBES growth rate projection for BellSouth for the same period was 8.41 per cent.

It is clear to us from these comparisons that, contrary to witness Billingsley's testimony, his index is not comparable in risk to BellSouth and therefore the results of his DCF analysis on this index are not reflective of the true cost of equity for BellSouth. Moreover, this comparison shows that the index of RBHCs and large independent telephone companies relied on by witness Cornell is comparable in risk to BellSouth and therefore the results of his DCF analysis on this index are reflective of the true cost of equity for BellSouth.

Witness Billingsley next employs the common form of the CAPM model. To use this model, he has to make assumptions regarding the appropriate beta, market return, and risk-free rate. He uses a prospective measure of beta supplied by BARRA. The beta coefficient measures the systematic risk of investing in a security. The systematic risk is the risk that cannot be eliminated through diversification. Generally speaking, the higher the beta, the greater the risk and vice versa. The average beta for witness Billingsley's index is 0.90. To estimate the market return, he applies the same form of the DCF model discussed earlier to the S&P 500 index of companies. Using market data for the month of October 1997, he estimates an expected return on the S&P 500 of between 15.61 per cent and 15.77 per cent. Finally, for the risk-free rate, he uses the average expected yield implied by the prices of 20-year Treasury bond futures contracts quoted during October 1997 of 6.73 per cent. Based upon his CAPM analysis, he concludes that the cost of equity for BellSouth is in the range of 14.72 per cent to 14.87 per cent.

In his other analysis, witness Cornell uses the market risk premium form of the CAPM model. To employ this model, he has to make assumptions regarding the appropriate beta, market risk premium, and risk-free rate. He considers two measures of beta. The first measure, based on historical stock returns, was provided by Dow Jones Beta Analytics. The average beta for his index from this source is 0.77. To confirm the reasonableness of this approach, he also considers the prospective measure of beta supplied by BARRA. The beta for BellSouth for the same period is 0.72. He defines the market risk premium as the added expected return that investors require to hold a broad portfolio of common stocks instead of risk-free Treasury securities. Based on a DCF analysis of the S&P 500 using the same DCF model discussed earlier, he determines a market risk premium over one-month Treasury bills of 5.90 per cent and a market risk premium over 20-year Treasury bonds of 4.53 per cent. He also considers the historical spread between total stock returns and treasury returns as calculated by

Ibbotson Associates. The arithmetic average spreads (indicated market risk premiums) over one-month Treasury bills range from 5.37 per cent to 9.03 per cent. The average spreads over long-term Treasury bonds range from 4.04 per cent to 8.00 per cent. Based on these analyses, he concludes that reasonable estimates of the market risk premium are 7.5 per cent over one-month Treasury bills and 5.5 per cent over 20 year Treasury bonds. Finally, for the risk-free rate, he uses the average yields on one-month Treasury bills and 20-year Treasury bonds. For one-month Treasury bills he uses a long-run average yield of 5.36 per cent and for 20-year Treasury bonds he uses the average yield for December 1996 of 6.73 per cent. Based upon his CAPM analysis, he concludes that the cost of equity for BellSouth is in the range of 10.97 per cent to 11.14 per cent.

Upon consideration, we find that witness Billingsley's CAPM analysis overstates the true cost of equity of BellSouth. We are persuaded by witness Cornell's testimony that had witness Billingsley properly taken into account the fact that the growth rates used in his analysis would eventually slow, he would have arrived at market risk premiums more consistent with what is supported in the current financial literature. Witness Cornell notes several current articles which discuss the forward-looking market premium over Treasury bonds in the 2.0 per cent to 6.0 per cent range. In witness Billingsley's analysis, the difference between his indicated market return through December 1997 of 15.48 per cent and the YTM on 20-year Treasury bond futures contracts through December 1997 of 6.35 per cent indicates a market premium of 9.13 per cent, well in excess of the level supported by independent sources. The unrealistically high market risk premium aside, if one accepts the 15.48 per cent indicated market return and calculates the CAPM result using the updated YTM on 20-year Treasury bonds of 6.35 per cent and the forward-looking BARRA beta for BellSouth as of December 31, 1997, of .76, the CAPM estimate is 13.3 per cent. However, considering the testimony of witness Cornell that witness Billingsley's single-stage DCF analysis of the S&P 500 produces an upwardly biased estimate of the market return and that the derived market risk premium is well above the level discussed in current financial literature, we find that the 13.3 per cent indicated return is above the top of the range of reasonableness.

In discussing his CAPM analysis, witness Cornell concedes that for purposes of estimating the long-term cost of capital there is a preference for using the long-term interest rate. He also agrees that it would be reasonable to use the predicted BARRA beta

instead of a historical measure of beta in the CAPM analysis. Using the same measure of beta and the risk-free rate assumed in the revision to witness Billingsley's CAPM analysis and the top of the range of forward-looking market risk premiums of 6.0 per cent from witness Cornell's analysis, the indicated CAPM estimate of BellSouth's cost of equity is 10.9 per cent.

In his final approach, witness Billingsley applies a market risk premium analysis. He defines the equity market risk premium as the difference between the return on a broad basket of equity securities (the market) and the return on a low-risk or riskless benchmark security. In this analysis, he calculates the risk premium as the difference between the expected return on the S&P 500 and the current market yields on public utility bonds from the period October 1987 through October 1997. To estimate the market return, he applies the same form of the DCF model discussed earlier to the S&P 500 index of companies. Because BellSouth's debt is rated AAA, he uses the yield on AAA-rated public utility bonds. His analysis shows that the average risk premium from 1987 to 1997 was 6.80 per cent. Adding this premium to the three month (August-October 1997) average return on AAA-rated public utility bonds of 7.30 per cent produces a cost of equity for the S&P 500 of 14.10 per cent. However, he testifies that when interest rates decline, the equity risk premium widens and when interest rates rise, the equity risk premium narrows. He cites a study conducted by R.S. Harris and F.C. Marston to support this opinion. Based on this study, witness Billingsley testifies the risk premium must be increased. During the period of the Harris and Marston study, the average risk premium was 6.47 per cent and the average yield on long-term Treasury bonds was 9.84 per cent. Because the yield on 30-year Treasury bonds had decreased to 6.33 per cent (October 1997), witness Billingsley argues that the appropriate risk premium is 8.76 per cent instead of the 6.47 per cent risk premium indicated by the Harris and Marston study. Using this alternative approach, he concludes that his analysis indicates an expected return on the S&P 500 of 15.09 per cent, the current average level of 30-year Treasury bonds of 6.33 per cent plus the adjusted risk premium of 8.76 per cent.

Upon consideration, we find that BellSouth witness Billingsley's risk premium analysis overstates the true cost of equity of BellSouth. In reviewing witness Billingsley's market risk premium analysis, we note that the market premium is not constant but instead increases and decreases over time. The risk premium over the period covered by witness Billingsley's analysis varied from as little as 3.92 per cent to as great as 8.49 per

cent. For this reason, it appears that the average risk premium calculated using this analysis already accounts for changes in the risk premium due to changes in the level of interest rates. We believe it would amount to double counting to include the additional 2.29 per cent premium (witness Billingsley risk premium of 8.76 per cent less Harris and Marston risk premium of 6.47 per cent) that witness Billingsley includes in his risk premium estimate of BellSouth's cost of equity. Removing this 2.29 per cent premium, the indicated return for the S&P 500 is 12.8 per cent, without accounting for the fact that the average yield on 30-year Treasury bonds continued to decline from October 1997 through December 1997. Moreover, this number is conservatively high, because it reflects the cost of equity for the S&P 500. The S&P 500, with an assumed beta of 1.00, is generally considered more risky than individual companies with betas significantly less than 1.00, such as BellSouth with a beta of .76.

Based upon a detailed review of the cost of equity methodologies presented, we find, upon consideration, that the cost of equity for BellSouth falls within the range of 10.9 per cent to 12.8 per cent. Since a point estimate of the cost of equity must be used to establish the overall cost of capital, we are persuaded by the weight of the evidence that the cost of equity is more appropriately set at the higher end of the range. We shall, therefore, use 12.0 per cent for purposes of these proceedings.

Overall Cost of Capital

BellSouth witness Billingsley discusses at length his opinions of the risk being faced by companies in the telecommunications industry since the passage of the Act. However, in his discussion of risk he overlooks two fundamental points. First, we believe that witness Billingsley ignores the benefits that will accrue to BellSouth as a result of the passage of the Act. If investors are sophisticated enough to recognize the risks associated with increased competition as a result of the Act, then they are clearly sophisticated enough to recognize that BellSouth is well positioned to take advantage of all of the provisions of the Act. Although witness Billingsley's assessment of the level of competition may apply to some lines of business engaged in by a few of the companies in this industry, the May 1997 S&P Utility Credit Report for BellSouth supports the view that BellSouth is well positioned to take advantage of the new environment created by the passage of the Act. That report states that the adoption of price cap plans most of BellSouth's territory increases long-term earnings prospects, especially since the company has demonstrated an ability

to control its costs. The report further states that expense management, among other things, will allow the company to maintain its profit levels even as competition emerges. In addition, the report notes that the company's market strength and financial stability should allow to maintain its competitive position in the future.

In addition, in BellSouth's debt rating reference manual prepared for S&P and Moody's Investor Services, BellSouth presented two schedules for the bond rating services entitled Summary of All Competitive Impacts (Assumed Losses to Revenue) and New Product Revenues. These reports were filed under protection of confidentiality and therefore we do not discuss the actual figures. However, it is clear in reviewing these two reports, which cover the years 1997 through 1999, that BellSouth has been and projects to be a net beneficiary of the changes brought about in the telecommunications industry as a result of deregulation. The implication of witness Billingsley's testimony that investors would only be concerned with the risks associated with competition in this industry ignores the fact that BellSouth is well positioned to grow and prosper in this new environment and that these views would also be factored into investors' perception of risk and expected return.

Second, we believe that witness Billingsley misstates the risk that is relevant to these proceedings. Witness Cornell testifies that the telecommunications industry is a very broad category which includes such businesses as BellSouth's wireless communications endeavors and its international operations. He points out, however, that the business for which the cost of capital is being estimated in these proceedings is the business of leasing local exchange telephone network elements to retail providers. Witness Cornell notes that in its August 8, 1996, First Order and Report, FCC 96-325, at ¶702, the Federal Communications Commission (FCC) explicitly defined the relevant risk in this type of proceeding as the risk incurred in the business of leasing unbundled network elements. Witness Billingsley acknowledges that for purposes of setting prices in these proceedings, we should only consider the forward-looking cost of capital associated with the provision of unbundled network elements. Witness Cornell testifies that the business of leasing network elements is of relatively low risk compared to many of the risky business endeavors being pursued by the telephone holding companies. He also notes that in FCC 96-325, supra, at ¶11 and ¶702, the FCC described the current competitive position of the ILEC's network element business as being natural or bottleneck monopolies which do not now face significant

competition. For these reasons, we find that the discussion of risk in witness Billingsley's testimony, to the extent it deals with the global state of the telecommunications industry rather than the actual business of leasing unbundled network elements in Florida, is irrelevant to the determination of the cost of capital in these proceedings.

For the reasons we discuss earlier, we believe that this overall cost of capital is a conservatively high estimate of BellSouth's true forward-looking cost of capital. AT&T/MCI witness Cornell testifies that BellSouth's use of an 11.25 per cent cost of capital "is far in excess of the forward-looking cost of capital for the provision of network elements or universal service, and is inconsistent with publicly available cost of capital estimates by parties outside the context of these proceedings." He notes that the FCC determined an 11.25 per cent cost of capital for BellSouth in September 1990. Since the time of that determination, 30-year Treasury bond rates have fallen over 300 basis points from an average of 8.99 per cent in September 1990 to an average of 5.96 per cent in December 1997. Witness Cornell also provides reports from Merrill Lynch and Salomon Brothers that document these companies' estimates of the cost of capital of the RBHCs. In a report dated January 1996, Salomon Brothers estimated the cost of capital for the RBHCs of approximately 8.6 per cent. In its proxy statement dated September 1996 regarding the merger of Bell Atlantic and NYNEX, Merrill Lynch performed a DCF analysis of the companies and assigned discount rates (implied costs of capital) of 8 per cent to 10 per cent for the telephone operations. Witness Cornell concludes that given the significant decline in capital costs as indicated by the drop in yields on 30-year Treasury bonds and "the real-world, investor-oriented evidence" discussed in his testimony, there is no evidence to support 11.25 per cent as the true cost of capital of BellSouth.

Based upon the evidence in the record, we find, upon consideration, that BellSouth's overall cost of capital is 9.90 per cent. This number falls out from the capital structure of 60 per cent equity and 40 per cent debt, a forward-looking cost of debt of 6.7 per cent and a cost of equity of 12.0 per cent, all of which we establish above.

B. Depreciation

Both of the cost models presented by the parties in these proceedings contain assumptions regarding depreciation rates and resulting expenses. Two witnesses testified on the appropriate

depreciation lives and resultant rates to use in UNE calculations. AT&T/MCI witness Majoros presented direct and rebuttal testimony. BellSouth witness Cunningham also presented rebuttal testimony. While there is disagreement between the parties regarding the specific lives and salvage values to use in these proceedings, both witnesses agree that it is appropriate to use projection lives since, by definition, these lives represent newly placed plant and therefore comport with the FCC's requirement of using forward-looking costs. Both witnesses seem to agree that remaining lives are inappropriate since they relate to the life remaining of the embedded assets.

AT&T/MCI witness Majoros recommends that the lives and salvage values used in BellSouth's cost studies should be those projection lives and future net salvage values underlying the depreciation rates prescribed by the FCC for BellSouth in Florida in 1995. Based on his review of recent trends in the depreciation reserve and historical life indications and retirement patterns of the technologically affected accounts, witness Majoros asserts that the FCC's prescribed projection lives and future net salvage values represent forward-looking costs.

Witness Majoros points to the fact that BellSouth's reserve level has grown from 35.3 per cent in 1990 to 48.9 per cent in 1996. Its depreciation rates have averaged 7.3 per cent over the last seven years, while its retirement rates have averaged only 3.6 per cent. Witness Majoros explains that an increasing reserve is generally a sign that depreciation rates anticipate increasing retirement levels and the expected life of the plant is decreasing. Without indications of a decreasing life, witness Majoros asserts that an increasing reserve might be a sign that depreciation rates are too high.

Witness Majoros provided a comparison of BellSouth's historical lives and retirement patterns of the technologically affected accounts, i.e., digital switching, digital circuit, metallic cables, to the FCC's prescribed lives and retirement patterns. This comparison shows that recent life indications for these accounts are longer than the projection lives prescribed by the FCC. Also, the comparison shows that the FCC's expected retirement pattens for these accounts reflect higher retirements than indicated by history. Witness Majoros therefore concludes that the FCC's 1995 prescribed lives and retirement patterns are forward-looking.

As further support for AT&T/MCI's position, witness Majoros points out that the FCC directed its staff over a decade ago to put less emphasis on historic data in estimating depreciation lives and more emphasis on company plans, technological developments, and other future-oriented analyses. Also, he explains that the FCC reaffirmed its forward-looking position in establishing ranges of projection lives to simplify the depreciation prescription process. The ranges were based on a review of recent retirement patterns, company planning, and the current technological developments and trends.

BellSouth witness Cunningham asserts that the FCC prescribed projection lives and future net salvage values are not forward-looking because they do not properly assess the impact of technological evolution and increasing competition. He proposes that the appropriate lives and salvage values to use in these proceedings are the results of the 1995 and 1996 nine-state regional BellSouth Depreciation Studies. These proposed values reflect a simple average of the proposed lives for the nine states. According to witness Cunningham, these studies contain a summary of most of the planning material and forecasting assumptions used in the development of BellSouth's proposed economic lives for each of the nine states and was augmented by additional information gathered through discovery in these proceedings. BellSouth asserts that these depreciation studies contain thousands of pages of data and analysis supporting its assessment of appropriate lives. Further, no party to these proceedings made a similar analysis of plant lives or derived an independent and current assessment of appropriate lives.

As further support for the reasonableness of BellSouth's recommended lives and salvage values, witness Cunningham asserts that these values are generally consistent with the depreciation lives and salvage values BellSouth uses for public reporting purposes. Witness Cunningham also claims that BellSouth's proposed lives are comparable to the lives the FCC last prescribed for AT&T in 1994. Lastly, he states that BellSouth's proposed lives are similar to the projection lives used to determine the intrastate depreciation rates that BellSouth is currently booking in Florida.

In contrast, witness Cunningham testified that emphasis on historical retirement patterns is an indication that one expects the future not to vary significantly from the past. He asserts that retirements, particularly for the technology-sensitive accounts, lag well behind the decline in economic value of the assets. As an example, witness Cunningham refers to technologies

of the past, such as Step-by-Step and Crossbar Switching, as evidence that the bulk of retirements are most often concentrated at the end of the life span of a technology and would not be captured simply by focusing on history. Further, witness Cunningham argues that the fact that BellSouth's reserve has grown over time is not an indication that the reserve is not at the appropriate level. He states that the issue is whether the reserve has increased enough to handle retirements caused by the shift that has occurred in the telecommunications industry.

Witness Cunningham testified that the lives BellSouth recommends for use in its cost studies are based on the economics of providing traditional telecommunications services, and would be appropriate even if the only services BellSouth ever provided in the future were narrowband, traditional telephone services. Regarding concerns raised in other jurisdictions as to the appropriateness of the lives used in BellSouth's cost studies for a narrowband network, witness Cunningham responded that the recommended lives do not consider broadband, entertainment, or some shift in existing competition. Witness Cunningham submits that replacement of today's network will occur due to normal mortality and technological obsolescence, i.e., when the current technology is not the most efficient means of providing narrowband service in the future.

AT&T/MCI witness Majoros asserts that lives specific to Florida should be used for UNE calculations since that data is available. He further asserts that the lives BellSouth uses for financial accounting purposes are inappropriate for UNE calculations because those lives assume the replacement of telecommunications plant to provide non-regulated video services. However, BellSouth has indicated that it does not have plans to deploy a video network in Florida. Also, witness Majoros states that the FCC has ordered that the accelerated replacement of older facilities for the benefit of unregulated service offerings should be excluded from the regulated accounts.

Because the purpose of these proceedings is to establish prices for UNEs specific to Florida, we agree with AT&T/MCI witness Majoros that where Florida-specific information is available, it should be used. BellSouth's position regarding depreciation, however, is to use projection lives and future net salvage values that reflect the simple average of its depreciation studies for its nine-state region. When witness Cunningham was asked why he believed average regional lives should be used in the UNE calculations rather than Florida-specific lives, he simply stated

that he was asked to submit regional lives by BellSouth's cost organization. Our decisions, shown in Tables III and IV are based on Florida-specific data and planning presented in this proceeding. The most controversial accounts, of course, are the technology driven accounts, digital switching and circuit, and metallic and fiber cables.

Witness Majoros asserts that the FCC's prescribed projection lives and retirement patterns reflect shorter lives and higher retirements than indicated by historical statistics. As such, we find that it is reasonable to assume that the depreciation rates developed by the FCC for its 1995 proceedings included consideration of an increasingly competitive telecommunications market.

The purpose of these proceedings is not to direct BellSouth to use specific depreciation rates for pricing its retail business, but instead to establish the appropriate cost methodologies to be incorporated in the cost models for pricing UNEs. In these proceedings, BellSouth does not seek regulatory approval of its depreciation rates. Rather, we are to determine the reasonableness of the competing assumptions regarding depreciation expenses to be included in the cost studies used for setting UNE rates.

Ideally, BellSouth would have conducted a study reflecting the lives and salvage values for the network it has included in its TSLRIC studies. However, BellSouth submitted instead nine depreciation studies it conducted in 1995 and 1996 for the FCC. These studies reflect analyses of embedded plant with a recognition of the future.

Lives

The projection life is a forecast projection of the future of the property. Historical indications may be useful in estimating a projection life. Trends in life or retirement can sometimes be expected to continue. The reason for making a historical life analysis is to develop a sufficient understanding of history in order to evaluate whether it is a reasonable predictor of the future. Technical and economic obsolescence are ongoing, and an historical life analysis will reflect these factors to the extent that they were present in the past. As discussed earlier, AT&T/MCI's depreciation proposals reflect what was prescribed by the FCC for BellSouth of Florida in 1995. A comparison of these lives with those proposed by BellSouth in its 1995 Florida-specific study indicates no difference in 12 accounts. We find that,

therefore, the Florida-specific projection lives appear forward-looking, reasonable, and appropriate for use in these proceedings.

AT&T/MCI did not address projection lives for ten accounts: Aircraft, Special Purpose Vehicles, Analog Switching, Radio, Circuit-DDS, Circuit-Analog, Large PBX, Other Terminal Equipment, and Submarine cable-Metallic and Fiber. A review of the data provided in BellSouth's Florida-specific study and in response to discovery indicates that the resulting BellSouth projection life proposals for seven of these accounts appear reasonable. The exhibits show that the Aircraft account has no Florida investment; therefore we shall prescribe life for this account. The two remaining accounts are the Metallic and Fiber Submarine Cable accounts.

BellSouth's Florida-specific study states that submarine cable is flanked on either side of the splice by runs primarily of buried cable. The retirement of submarine cable is therefore expected to occur concurrent with the retirement of the flanking metallic cable. We believe that it is reasonable for the projection life of submarine metallic cable to be the same as for metallic buried cable. We discuss metallic buried cable below as one of the technology-sensitive accounts.

We agree with BellSouth that with a new technology, such as fiber cable, enhancements and refinements to preexisting technology are still taking place due to such things as manufacturing defects and fiber clouding. While there is no reason to think future generations of fiber submarine cable will not live similarly to copper cable, we believe that the earlier generations of this technology cannot be expected to experience that type of life characteristic. Upon consideration, therefore, we find BellSouth's 20-year projection life from its Florida-specific study to be reasonable and appropriate to use in these proceedings.

Of the remaining ten accounts, five accounts, Digital Switching, Digital Circuit, and the three metallic cable accounts, are technology-sensitive, represent the majority of investment, and are the most controversial. BellSouth's proposed projection lives for these accounts are the result of using the technology substitution model, the purpose of which is to determine how fast a new technology is displacing an older technology. In this case, the model forecasts the rate at which fiber technology is substituting for copper technology. According to witness Cunningham, the substitution model was used to determine the average remaining life for each account and then a projection life

or economic life was determined. The projection life was a derived figure depending on the remaining life and curve shape (retirement pattern) of the given account.

Regarding the technology substitution model BellSouth used to determine its projection lives, witness Majoros agreed that certain technological changes, like Asymmetrical Digital Subscriber Line (ADSL), could extend rather than shorten copper plant lives. We are skeptical that ADSL will extend the life of copper plant, but we do believe that the use of ADSL may permit the copper cable plant to fulfill its life expectancy rather than shorten or lengthen it. Witness Cunningham agreed that the substitution model only recognizes new technologies substituting for old technologies. It does not recognize such complementary or demand-enhancing technologies as ADSL. We believe that this is a weakness in the substitution model.

Further, witness Cunningham agreed that the substitution model is based on several input assumptions that are under the control of the person performing the analysis. Different assumptions could therefore yield different results with the model. This, we believe, makes the outputs of the model very subjective.

We believe that BellSouth's studies are based on its desire to replace copper with fiber in the network. Regarding the deployment of fiber in the feeder portion of the network, BellSouth's Florida-specific study envisions 99 per cent substitution by 2005. Also, we note that witness Cunningham stated that the company will no longer tie a metallic cable to the main frame. BellSouth is not replacing existing copper feeder facilities with fiber. Fiber is simply the choice where no existing facilities exist. Certainly, with virtually limitless transport capacity of fiber cables, as more fiber feeder facilities are installed, there will come a time when the circuits transported over copper facilities will be switched over to the installed fiber facilities. The ultimate question is when will that occur.

In Practical Technology Forecasts, Technology Futures, Inc., 1994, at pages 89-90, regarding the accuracy of predictions resulting from the substitution model, the author, James R. Bright, submits that the accuracy of predictions based on the first five to ten percent of displacement data may be very poor, while forecasts based on 20 per cent to 25 per cent displacement data seem to be quite accurate. Witness Cunningham neither agreed nor disagreed with Bright's assessment of predictions based on the first 5 to 10 per cent displacement data, but stated that accuracy would depend

upon other information, such as company planning, factored into the analyses.

Witness Cunningham was asked to provide the annual rate of displacement of copper with fiber in the feeder network for every year since BellSouth began installing fiber feeder. This information would have served as another check on the reasonableness of the substitution model's predictions of the demise of copper facilities. Unfortunately, the material that witness Cunningham submitted did not relate to the annual rate of displacement of copper, but rather to the average substitution rate of copper.

As for installing fiber in the distribution portion of the network, BellSouth is actively pursuing the development of fiber in loop architectures, and anticipates 99 per cent fiber deployment by the year 2015. Further, BellSouth's depreciation study indicates that residential broadband will have a significant impact on the future distribution network. The study narrative states that services supported by a broadband network range from very low bit rate telemetry to conventional voice and high-fidelity audio, and will include various video formats.

BellSouth's cost model assumes an efficient cross-over point for fiber in the feeder loop. BellSouth has employed a 12,000 foot cross-over point for fiber deployment, indicating that this is the most efficient least-cost technology for telephone service. Consequently, all copper in the loop is presumed to be the most efficient least-cost technology for providing telephone service. These cost model assumptions are contrary to BellSouth's depreciation study assumptions for replacing copper with fiber as we have discussed above. Also, BellSouth's cost model assumes all distribution facilities to be copper, which also appears contrary to the depreciation studies based on BellSouth's apparent intention to replace copper with fiber in the distribution network.

Based on the evidence in the record, the lives we find appropriate for use in UNE calculations in these proceedings are shown in Table III below.

TABLE III
Projection Lives

Category	Commission Approved Projection Life (years)
Motor Vehicles	7.5
Aircraft	not applicable
Special Purpose Vehicles	7.0
Garage Work Equipment	12.0
Other Work Equipment	15.0
Buildings	45.0
Furniture	11.0
Office Support Equip.	10.5
Company Comm. Equip.	7.0
Computers	4.4
Analog Switching	4.2
Digital Switching	16.0
Operator Systems	10.0
Radio	7.0
Circuit-DDS	6.0
Circuit-Digital	10.5
Circuit-Analog	6.8

Category	Commission Approved Projection Life (years)
Large PBX	5.0
Public Telephone	7.0
Other Terminal Equip.	6.0
Poles	35.0
Aerial Cable-	18.0
Aerial Cable-Fiber	20.0
Undergrd. Cable-Metallic	23.0
Undergrd. Cable-Fiber	20.0
Buried Cable-Metallic	18.0
Buried Cable-Fiber	20.0
Submarine Cable-Metallic	18.0
Submarine Cable-	20.0
Intra-Building Cable-Met.	20.0
Intra-Building Cable-Fiber	20.0
Conduit	55.0

Here, we compare BellSouth's past forecasts of retirements and additions with its actual achievement as presented in the studies in Table V and Table VI.

TABLE V
1989 and 1992 BellSouth Retirement Forecast for Metallic Cable Accounts

	1989 Forecast ($000)	1992 Forecast ($000)	Actual 1992-1994 Retirements ($000)
Aerial	$ 63,700	$ 60,735	$ 59,845
Underground	52,100	160,341	44,651
Buried	161,900	231,855	68,931

TABLE VI
1989 and 1992 BellSouth Forecast for Metallic Cable Account Additions

	1989 Forecast ($000)	1992 Forecast ($000)	Actual 1992-1994 Additions ($000)
Aerial	$ 84,300	$ 97,162	$125,901
Underground	69,600	33,552	38,189
Buried	214,800	282,951	314,412

These comparisons illustrate that BellSouth's retirement forecasts have been much more aggressive than the actual results, whereas forecasts of additions have been understated. In the studies BellSouth has presented in these proceedings, the proposed lives are the result of a forecast of how fast fiber technology will displace copper facilities. If history is a guide, it is probable that BellSouth's forecasts for this displacement will be overstated. Witness Majoros testified that the use of copper circuits has increased since BellSouth's last intrastate depreciation prescription, which indicates that the technology displacement is not taking place.

Based on the above discussions, we find that use of the life projections proposed by AT&T/MCI witness Majoros and prescribed by the FCC for BellSouth of Florida for the five technology-sensitive accounts is appropriate. There is enough conflict between the

assumptions used in BellSouth's depreciation study and the assumptions used in its cost studies to question the appropriateness of the results of the depreciation study in these proceedings. Further, we have raised several concerns regarding the technology substitution model that BellSouth employed to determine the projection lives for these accounts. Also, as we have observed, BellSouth's previously submitted forecasts suggest that BellSouth's current forecasts may not be reliable.

For the three fiber cable accounts, we find upon consideration that use of BellSouth's projection lives of 20 years from its Florida-specific study is appropriate. As we discussed earlier for submarine fiber cable, we believe that earlier generations of this technology cannot be expected to experience the same type of life characteristic expected for future generations. We find that BellSouth's Florida-specific lives recognize that fiber technology is continuing to be enhanced and refined.

The two remaining accounts to be addressed are Motor Vehicles and Computers. BellSouth studied the Computers account by its three major categories of investment: mainframe, minicomputers, and personal computers. The study narrative states that the rapid advance of computer hardware has made it economical to retire computers at an increasing rate. We agree with BellSouth that the life span of personal computers is heavily influenced by technological advances and competition. BellSouth has projected a life of five years for the mainframe and minicomputer categories and a life of 3.5 years for the personal computer category. The five-year projection life for the mainframe category is certainly in line with the historical life span of 5.8 years. Life indications continued to decrease in the 1991-1996 period. Upon consideration, we find appropriate the use of BellSouth's Florida-specific projection life of 4.4 years for the Computers account.

For Motor Vehicles, BellSouth's Florida-specific projection life of 8 years represents a composite of 7.5 years for light motor vehicles and 10 years for other motor vehicles. These lives are in line with the account's experience and future plans of the company. Upon consideration, we find appropriate the use of BellSouth's proposed Florida-specific projection life of 8.0 years for motor vehicles.

Salvage Values

The salvage values BellSouth proposes reflect a simple average of the salvage values BellSouth proposed in its 1995 and 1996

regional depreciation studies. The salvage values AT&T/MCI recommends reflect those approved by the FCC in BellSouth's 1995 depreciation prescription for Florida. BellSouth's proposed salvage values specifically for Florida agree with those the FCC prescribed, and therefore with those recommended by AT&T/MCI, for all but eleven accounts (Special Purpose Vehicles, Analog Switching, Radio, Circuit DDS, Circuit Digital, Circuit Analog, Large PBX, Other Terminal Equipment, Aerial Cable-fiber, and Submarine Cable-Metallic and Fiber).

AT&T/MCI does not address nine accounts (Special Purpose Vehicles, Analog Switching, Radio, Circuit DDS, Analog Circuit, Large PBX, Other Terminal Equipment, and Submarine Cable-Metallic and Fiber). For these accounts, we find appropriate the use of the future net salvage proposals found in the BellSouth Florida-specific study. These proposals are reasonable estimates of future expectations for these plant types and are supported by the study.

The remaining two accounts are Digital Circuit and Aerial Cable Fiber. There is no difference in the parties' positions for Digital Circuit and BellSouth's Florida-specific study suggests a future net salvage of 2 per cent. BellSouth points out that a major portion of the salvage currently being realized is due to reuse of channel banks and panel equipment. With the increase of digital technology, however, we believe the reuse potential for this equipment will be minimal. Any removal costs should offset the attendant salvage. Upon consideration, we find that a 0 per cent future net salvage proposal is reasonable and therefore appropriate.

There is a minor difference in the parties' positions regarding aerial cable-fiber. Witness Cunningham recommends use of a negative 15 per cent net salvage based on BellSouth's regional studies. BellSouth's Florida-specific proposal for this account is negative 12 per cent. Witness Majoros recommends use of a negative 11 per cent net salvage value, which the FCC prescribed for BellSouth Florida in 1995. The BellSouth depreciation studies provide no insight regarding BellSouth's Florida-specific future net salvage proposal of negative 12 per cent. The data presented in the studies, however, show limited history, with recent net salvage averaging negative 4 per cent. In any case, we find no reason to believe that future costs to remove aerial fiber cable should be any less than the costs to remove aerial copper cable. For this reason, we find it appropriate to accept AT&T/MCI's recommended negative 11 per cent net salvage. Based on the evidence in the record, the salvage values we find appropriate for

use in UNE calculations in these proceedings are shown in Table IV below.

TABLE IV
Salvage Values

Category	Commission Approved Net Salvage (%)
Motor Vehicles	10.0
Aircraft	not applicable
Special Purpose Vehicles	0.0
Garage Work	0.0
Other Work Equipment	1.0
Buildings	4.0
Furniture	14.0
Office Support Equip.	10.0
Company Comm. Equip.	10.0
Computers	0.0
Analog Switching	0.0
Digital Switching	0.0
Operator Systems	0.0
Radio	(5.0)
Circuit-DDS	0.0
Circuit-Digital	0.0
Circuit-Analog	(10.0)
Large PBX	0.0
Public Telephone	10.0
Other Terminal Equip.	(4.0)
Poles	(75.0)
Aerial Cable-Metallic	(11.0)

Category	Commission Approved Net Salvage (%)
Aerial Cable-Fiber	(11.0)
Undergrd. Cable-Metallic	(7.0)
Undergrd. Cable-Fiber	(6.0)
Buried Cable-Metallic	(8.0)
Buried Cable-Fiber	0.0
Submarine Cable-Metallic	(5.0)
Submarine Cable-Fiber	(5.0)
Intra-Building Cable-Met.	(12.0)
Intra-Building Cable-Fiber	(12.0)
Conduit	(7.0)

C. Tax Factors

In Order No. PSC-96-1579-FOF-TP, we noted that BellSouth found fault with the Hatfield model because it did not use BellSouth or Florida-specific input data. In our decisions therein we did not rely on the Hatfield model. Yet, in these proceedings, BellSouth's cost model uses a non-Florida-specific income tax factor.

In these proceedings as well, the Hatfield model used by AT&T and MCI does not contain Florida-specific tax factors. AT&T/MCI witness Wood testified that the Hatfield model was run with BellSouth Florida-specific factors, that "99 per cent or so" of the other input values in the Hatfield model are not default values and are already specific to Florida, BellSouth's operating territory, or to smaller areas within BellSouth's operating territory. However, AT&T/MCI witness Klick testifies that the tax factors used were the default factors, meaning that they are the average factors for the nine state region including Florida. We note that neither the Hatfield model nor documentation supporting the Hatfield model's inputs was submitted in these proceedings.

BellSouth witness Caldwell states that BellSouth used the regional income tax of 38.71 per cent in the models. Witness Caldwell also indicates that BellSouth used a Florida-specific ad valorem and other tax factor. She provides the information and instructions required to replace any of the default tax factors in the model with the Florida-specific tax factors.

In describing the process of developing the non-recurring costs for UNEs, witness Caldwell states that gross receipts taxes are considered. She states that BellSouth has properly recognized shared and common costs and tax factors.

Because the rates or prices set in these proceedings will be for UNEs offered in Florida and for physical and virtual collocation in Florida, we find that Florida-specific tax factors are to be applied when they are available. This record does contain Florida-specific tax factors. Accordingly, and upon consideration, we find appropriate the use of the following Florida-specific tax factors: a combined state and federal income tax factor of 38.57 per cent, a gross receipts factor of 1.53 per cent, and an ad valorem and other factor of 1.20 per cent.

D. Shared and Common Costs

Based on the evidence in this record, as we discuss below, we find appropriate the common cost factors shown in Table VI and the shared cost factors shown in Table VII.

TABLE VI
Common Cost Factors

	Commission Approved Calculation
Costs common to both wholesale and retail operations.	$722,245,481
Total costs	$16,646,114,512

	Commission Approved Calculation
Total costs excluding costs common to both wholesale and retail	$15,923,869,031
Directly assigned and directly attributed retail costs	$1,642,286,205
Retail portion of allocated common costs	$74,487,789
Total retail costs	$1,716,773,994
Wholesale portion of allocated common costs	$647,757,693
Directly assigned and attributed wholesale costs	$79,996,598
Total wholesale common costs	$727,754,291
Total directly assigned and directly attributed wholesale costs	$14,201,586,228
Wholesale common cost factor	5.12%

TABLE VII
Shared Cost Factors

Account	Description	Commission Approved Factor
2121	Land and Building	0.0000
2211	Analog Electronic	0.0654
2212	Digital Electronic	0.0376
2215	Electromechanical	0.0596
2220	Operator Systems	0.0606
2231	Radio Systems	0.0462
2232	Circuit Equipment	0.0492
2232	Circuit Equipment	0.0493
2232	Circuit Equipment	0.0372
2232	Circuit Equipment	0.0372
2232	Circuit Equipment	0.0768
2311	Station Apparatus	0.3486
2341	Large PBX	0.0700
2362	Other Terminal Equipment	0.0816
2411	Poles	0.0243
2421	Aerial Cable	0.0293
2421	Aerial Cable	0.0233
2422	Underground Cable	0.0246
2422	Underground Cable	0.0232
2423	Buried Cable	0.0278
2423	Buried Cable	0.0233
2424	Submarine Cable	0.0234

Account	Description	Commission Approved Factor
2424	Submarine Cable	0.0231
2426	Intrabuilding Network Cable	0.0229
2426	Intrabuilding Network Cable	0.0237
2441	Conduit Systems	0.0212

BellSouth's Proposal

BellSouth asserts that the TSLRIC methodology it uses in these proceedings is consistent with the guidelines we established in Order No. PSC-96-1579-FOF-TP. There, we stated at page 25 that:

> We find TSLRIC should be defined as the costs to the firm, both volume sensitive and volume insensitive, that will be avoided by discontinuing, or incurred by offering, an entire product or service, holding all other products or services offered by the firm constant.

In that order, we stated further at page 33 that:

> Upon consideration of the evidence in the record and based on the Act, we find it appropriate to set permanent rates based on BellSouth's TSLRIC cost studies. The rates are for the unbundled network elements we consider to be technically feasible. The rates cover BellSouth's TSLRIC cost and provide some contribution toward joint and common costs.

While shared and common costs are not incremental to any one service that BellSouth provides, witness Varner contends that they are valid costs of doing business and must be recovered. Furthermore, BellSouth asserts that total revenues from all services must cover total incremental costs, in addition to

providing sufficient contribution to cover all other costs, if the firm is to remain in business.

BellSouth witness Reid discusses the appropriate methodology for including a reasonable amount of forward-looking shared and common costs in BellSouth's UNE rate calculations. BellSouth's basic approach is to compute two types of factors, shared cost factors, and a common cost factor. Shared costs are split between wholesale and retail shared costs, with retail shared costs excluded from the wholesale factors that ultimately are applied to the UNEs at issue in these proceedings. The labor portion of the shared wholesale costs is used to derive shared labor factors, which BellSouth used in its non-recurring cost studies. The remaining shared wholesale costs are attributed to various investment accounts and subsequently applied in the recurring cost studies. The common cost factor, computed as the ratio of wholesale common costs to total wholesale direct costs, is applied both in the company's recurring and non-recurring cost analyses.

BellSouth's starting point for analysis is its regional regulated 1995 expenses and regulated mid-year 1995 investment. Witness Reid contends that the 1995 data provides the greatest amount of detail that was available, i.e., detail by cost pool and cost sub-pool, which are disaggregations of higher-level account data. BellSouth asserts that this data was not available for 1996. BellSouth states that the only use of the 1995 data in the study was to determine a breakdown of expenses by individual account and subcategories within that account.

The next step in BellSouth's methodology involves the use of historical data consisting of ten months of actual cost data from 1996 to develop a projection of average costs and investments for the period 1997 to 1999. Once the ten months of 1996 data is annualized, the annual data is normalized to account for any unusual events. Witness Reid states that forecasted growth factors and productivity factors are then applied to the 1996 normalized costs to determine BellSouth's forward-looking costs. In addition, factors that reflect the relationship of current cost to original book cost are applied to the investment accounts. BellSouth claims that the use of these factors yields cost data that is representative of the forward-looking average costs for the period 1997 to 1999.

First, there are "direct wholesale costs." These are costs that are clearly and directly assignable to the wholesale function. For example, the costs of switches fit into this category. The

direct wholesale costs are then divided between those costs related to recurring functions and those that are related to other wholesale transactions such as non-recurring or special transactions. Second, there is the portion of shared costs attributed to wholesale. Shared costs are incurred in the production of two or more products or services by the same production process that does not span all the activities of the business. Typical shared costs include costs for items of general support equipment, procurement, engineering expenses, and human resources. Third, there is a reasonable portion of common costs applicable to wholesale operations. Common costs are costs that usually span all of the activities of the business, and the products and services it produces. These costs are not directly assignable or attributable to one product or service, but are necessary for the operation of the business as a whole. Typical common costs are items such as accounting and finance costs and executive costs.

While witness Reid contends that all of the costs applicable to the wholesale function must be recovered by UNE rates, he states that all the costs applicable to the retail function should be excluded. We agree that the costs associated with the retail function should be excluded from the calculation of UNE costs. However, as stated by BellSouth, the analytical difficulty with this approach is in separating the shared costs and the common costs into the wholesale and retail functions, and attributing the wholesale shared costs to each network investment category.

BellSouth witness Reid states that since the Uniform System of Accounts (USOA) does not identify categories by separating the shared costs and common costs between wholesale and resale, a study was necessary to determine the appropriate amounts to include in each category. BellSouth contends that its Cost Allocation Manual (CAM) and the reporting procedures that the company follows to separate its costs on a cost-causative basis between regulated and non-regulated activities provide an appropriate model on which to base this study. Witness Reid states that BellSouth uses the basic cost attribution principles of its CAM and the underlying cost pools and sub-pools that it maintains for CAM cost attribution purposes as the methodology for determining a breakdown of wholesale costs by categories. He contends that the wholesale costs identified as a result of this process are the appropriate costs to apply to a cost methodology that defines the cost for UNEs.

After proper categorization of these costs, BellSouth develops three types of factors. The first factor is the wholesale common cost factor. It represents the relationship between wholesale common costs and the sum of wholesale direct and wholesale shared costs. BellSouth's proposed wholesale common cost factor in these proceedings is 5.30 per cent. A second set of factors is the shared cost factors. The shared cost factors proposed by the parties in these proceedings are shown on Table VII. The shared cost factors are derived by dividing the shared cost assigned to a particular category of investment by the projected average investment in that category. The third set of factors is the shared labor factors, which reflect the relationship between shared costs and labor costs. The shared labor factors are derived for each work force group by dividing the attributed shared costs by the related salaries and wages. The purpose of these factors is to allow the inclusion of shared costs in labor rates. BellSouth asserts that they are primarily used to compute non-recurring charges that have labor components.

AT&T/MCI's Proposal

AT&T/MCI proposes a uniform 10.4 per cent markup, as used in the Hatfield model, to estimate common overhead costs in its collocation model and non-recurring cost model. AT&T/MCI witness Klick asserts that its proposed markup captures all of the relevant overhead costs, including any element-specific costs and a reasonable share of any common overhead costs. AT&T/MCI also proposes that the labor rates reflected in the AT&T/MCI Non-recurring Cost Model (NRCM) are the labor rates that we should approve.

BellSouth witness Reid asserts that AT&T/MCI's proposed markup is the value used in the Hatfield model, and is based more directly on historical data than BellSouth's model. In fact, witness Reid asserts that the 10.4 per cent factor is developed from AT&T/MCI's 1994 expense and revenue data as reported to the FCC in its ARMIS reports. Further, he states that some of the expense accounts that BellSouth treated as shared costs are treated as common costs in the Hatfield model's input value. Witness Reid then compares the level of the forward-looking factors that BellSouth proposed in these proceedings to factors which would have been produced if BellSouth had used historical data to calculate its factors. Witness Reid also compares AT&T/MCI's proposed 10.4 per cent common cost factor to BellSouth's proposed common cost factor.

Using first BellSouth's historic 1994 data and then BellSouth's projected data, witness Reid calculates common overhead factors in the same manner as AT&T/MCI does. Using BellSouth historical data for 1994, he obtains a 9.7 per cent factor, which is reasonably comparable to AT&T/MCI's proposed 10.4 per cent factor for that same time period. However, using BellSouth's projected data in the same formula, witness Reid's analysis yields a common cost factor of 6.4 per cent, considerably lower than AT&T/MCI's proposed 10.4 per cent but higher than BellSouth's proposed 5.30 per cent factor.

BellSouth witness Reid also contends that the company has taken various competitive effects into consideration in determining its shared and common costs. Witness Reid points out several ways that BellSouth has reflected productivity improvements in its cost study. He states that in the development of its inflation/growth factors, BellSouth includes a network operations productivity offset of 2.9 per cent per year. In addition, he states that BellSouth has had considerable reductions in its workforce, and has outsourced some of its activities. He asserts that BellSouth uses its Telephone Plant Index (TPI) as the growth factor in various accounts, which has the effect of adjusting expenses for the impact of its force reductions. For example, he contends that in BellSouth's General Support account (6120) alone, BellSouth has reduced its expense projection by approximately $23 million. In addition, supported by BellSouth's 10-K report, he asserts that BellSouth has reduced its employees per 10,000 access lines from approximately 40 in 1992 to approximately 28 in 1996. Witness Reid contends that BellSouth's adjustments to its projected data reflect a continuation on BellSouth's part to complete its proposed 11,300 work force downsizing.

Witness Reid further testifies that the reductions related to additional re-engineering initiatives, organizational alignment initiatives, and unspecified productivity changes were provided by BellSouth's network organization for budget purposes, but were not used in its cost study. Instead, he states that BellSouth specifically applies the expense savings for the 11,300 work force reduction, which is known and which affects these other factors. In other words, BellSouth substituted a specific, known reduction in workforce for the other factors that were unspecified and budget driven.

Witness Reid also asserts that BellSouth's shared and common cost study projects what its investment would be on a going forward basis and develops a ratio of these types of costs to that future

investment. BellSouth believes that its methodology creates a level of productivity by applying factors to the forward-looking least-cost investment based on projections of its current investment.

We note again, that while witness Reid's comparisons are insightful, neither the Hatfield model nor the documentation supporting the Hatfield model's numerous inputs was filed in these proceedings. Thus, we believe there is insufficient record evidence to evaluate the propriety of AT&T/MCI's proposed common cost factor. We also note again that we declined to rely upon the Hatfield model in our decisions in Order No. PSC-96-1579-TP. Upon consideration, we do not find appropriate the use of AT&T/MCI's proposed 10.4 per cent variable overhead in these proceedings.

While AT&T/MCI believes that we should accept its proposed overhead costs and labor rates based on its concerns with BellSouth's model, AT&T/MCI also proposes various adjustments to BellSouth's shared and common cost model. AT&T/MCI proposes an adjustment to BellSouth's expense development factors that included the removal of growth rates, a 50 per cent reduction in network operating expenses, and a 27 per cent reduction in general and administrative expenses. AT&T/MCI also proposes an adjustment to BellSouth's shared labor factors which has the effect of reducing the shared labor factors to zero and shifting recovery of those costs to the shared cost factors. Last, AT&T/MCI proposes excluding BellSouth's Local Carrier Service Center (LCSC) cost from the shared cost analysis, and revising the carrying costs that result when the cost of money and depreciation rates are adjusted. In addition, AT&T/MCI witness Lerma asserts that due to lack of available data, AT&T/MCI revisions to BellSouth's shared and common cost model reflect only those adjustments that could be quantified.

AT&T/MCI contends that we should not rely on BellSouth's shared and common cost model to calculate shared costs, common costs, or shared labor rates for use in developing UNE prices. Witness Lerma asserts that BellSouth's shared and common cost model is unreliable and unacceptable for calculating these costs because the model is not forward-looking; the outputs of the model cannot be confirmed; and the model contains many methodological errors.

AT&T/MCI asserts that BellSouth's shared and common cost model is deficient in determining the long-run shared and common costs of an efficient, forward-looking, least cost network. Witness Lerma contends that BellSouth's model does not derive the appropriate costs that would be incurred by BellSouth in a

competitive environment since it does not reflect long-run productivity improvements. Witness Lerma contends that the pressures to reduce costs in a competitive environment are greater than in a monopoly environment. Instead, he asserts that BellSouth's shared and common cost model is based on embedded historical costs, and largely projects costs that would be incurred if BellSouth simply did "business as usual" in 1997, 1998, and 1999.

Witness Lerma does acknowledge that the use of historical data may be appropriate to estimate forward-looking shared and common costs. For example, he asserts that the use of historical data may be appropriate if a trend analysis is used to compare what is happening with various companies within the industry. In fact, witness Lerma states that he performed a trend analysis using the information provided in BellSouth's cost studies.

On the basis of his analysis, witness Lerma proposes revisions to BellSouth's expense and investment development factors, converting the historical data to forward-looking data. He proposes that BellSouth's projected inflation/growth rates for the years 1997 to 1999 be removed. He also proposes a 27 per cent reduction in BellSouth's general and administrative costs (Accounts 6710 and 6720), and a 50 per cent reduction in BellSouth's network operating expenses (Accounts 6512 and 6530 through 6535).

Witness Lerma offers two reasons that BellSouth's shared and common cost model is not forward-looking. First, he explains that BellSouth's estimate of expenses for the years 1997 to 1999 in Account Nos. 6110 (Network Support), 6120 (General Support), 6510 (Other Property, Plant and Equipment), 6540 (Access), 6610 (Marketing), 6620 (Services), and 67xx (General and Administrative, excluding 6727) do not account for any productivity improvements.

Witness Lerma states that BellSouth has estimated expenses in these accounts by taking the expenses incurred by BellSouth during the first ten months of 1996, and extrapolating the 1996 expenses from the 10 months of historical expenses. He asserts that BellSouth has supplied no data to justify its extrapolation of the full year 1996 costs from the ten months of data or to support the normalizing adjustments made to its annualized 1996 data. BellSouth witness Reid asserts, however, that actual full-year 1996 data has subsequently been obtained and it is not significantly different from the ten months data that were analyzed. He testifies that the 1996 annualized total expenses excluding

depreciation were approximately $6.473 billion, whereas the actual 1996 ARMIS expenses were approximately $6.507 billion.

Witness Lerma also contends that BellSouth's assumption that its normalized and annualized 1996 expense levels will increase with inflation is wrong. He asserts that other than the effects of Hurricane Fran, the impact of the Olympics, the effects of a projected 11,300 employee workforce reduction, and the effects of a compensated absences issue, BellSouth's model assumes it will incur the same expenses in 1997 to 1999 as it did in the first ten months of 1996, and that those expenses will increase with inflation at a rate of approximately 3.5 per cent per year. Although BellSouth uses inflation and normalization adjustments for these accounts, witness Lerma contends that BellSouth's study is not forward-looking since it is not representative of an efficient least-cost network based on current technology. He asserts that BellSouth must consider all expense levels and productivity improvements related to an industry subject to competition that would result from workforce reductions, outsourcing and re-engineering initiatives that BellSouth will undertake as it enters a competitive environment.

Second, witness Lerma explains that while BellSouth claims it considered certain productivity improvements in its model, it did not consider a number of cost reductions that should be expected in a competitive environment. This contention relates to BellSouth's estimate of expenses for the years 1997-1999 for accounts 62xx (Central Office), 6310 (Information Origination/Termination), 6410 (Cable and Wire Facilities), 6530 (Network Operations), and 6727 (Research and Development).

Witness Lerma contends that BellSouth did not account for all of the cost reduction initiatives in these accounts that BellSouth itself identified. BellSouth's model estimated expenses for 1997 to 1999 for these accounts as described in his first example, except that the growth rate used for each year considered the impact of changes in demand, service enhancements, and productivity changes, as well as the effects of inflation. For these accounts, BellSouth's shared and common cost model used growth rates of 5.1 per cent in 1997, 4.5 per cent in 1998, and 4.2 per cent in 1999.Witness Lerma asserts that BellSouth's own supporting documentation indicates that cost reductions related to additional re-engineering initiatives, organizational alignment initiatives, and productivity changes were not considered in the development of BellSouth's growth rates. He further asserts that if these cost

reductions were considered, BellSouth's growth rates would be .7 per cent in 1997, .2 per cent in 1998, and 1.4 per cent in 1999.

Conclusion

We note first that BellSouth's actual 1996 data is merely 0.5 per cent higher than the annualized total expenses, excluding depreciation, reflected in the study. Because BellSouth's actual 1996 data is not significantly different than its annualized 1996 data, we find that BellSouth's use of partial 1996 data annualized is reasonably representative of the actual 1996 costs incurred by the company, and is therefore appropriate.

We also find that BellSouth's use of inflation/growth factors that range from 3.4 per cent to 5.1 per cent is reasonable. It appears to us that BellSouth has incorporated reasonable productivity offsets in developing its inflation/growth factors. As AT&T/MCI acknowledge, in addition to normalizing for unusual events such as Hurricane Fran and the Olympics, BellSouth has taken into consideration a workforce reduction of 11,300 employees. BellSouth's inclusion of the workforce reduction in the cost study is appropriate in lieu of other factors such as re-engineering initiatives, organizational alignment initiatives, and unspecified productivity changes. We find that the expense savings related to the specific work force reduction of 11,300 employees is reasonable. Based on the evidence, it appears to us that a workforce reduction of that level would affect those other factors. BellSouth has also taken into account various unusual events. Hence, we find that BellSouth's normalization of its 1996 data for these events is also appropriate.

Furthermore, because BellSouth's shared and common factors are based on the relationship between projected expenses to projected investments, and applied against forward looking investments, we find that BellSouth's factors have some inherent productivity gains. We believe that the incorporation of productivity in a forward-looking cost model is essential. We also believe that it is reasonable to assume that some growth will occur over the period 1997 to 1999. Based on the evidence and argument in the record, we find that BellSouth's projections of growth and productivity for the period 1997 to 1999 are appropriate.

Specific Reductions in General and Administrative and Network Operating Expenses

We have discussed BellSouth's model in a broad sense, i.e., its use of forward-looking costs and productivity improvements. Now we turn to specific adjustments to particular expense accounts. Where there is a direct relationship between particular expense and investment accounts, BellSouth combines the expenses with the capital carrying costs of the related investment accounts. For example, Motor Vehicle Maintenance expense (Account 6112) was combined with the capital-related costs of Motor Vehicle (Account 2112) The shared cost factor is determined by dividing the shared cost assigned to a particular type of investment by the projected average investment.

Witness Lerma asserts that the Automated Report Management Information System (ARMIS) data for 1989 through 1996 for all of the RBOCs indicates that General & Administrative expenses per line trended downward, with the specific decline ranging from as little as 22 per cent to as much as 54 per cent. BellSouth's General & Administrative expenses per line had a downward trend for that time period of 22.4 per cent. Witness Lerma points out that AT&T/MCI's proposed General & Administrative reductions are also based on the railroad industry, which experienced a 27 per cent reduction in General & Administrative expenses when it was deregulated.

BellSouth witness Reid contends that BellSouth accounts for substantial reductions in its General & Administrative expenses, demonstrating that a considerable amount of productivity is expected to occur in these expenses. Specifically, he states that BellSouth proposes approximately $84 million in reductions in expenses for the 67xx accounts related to its 11,300 work force reductions. He further states that BellSouth also proposes approximately $1.145 billion as a reduction for the 67xx accounts related to its normal operations on a going-forward basis.

AT&T/MCI witness Lerma contends that BellSouth's network operating expenses will also be reduced by the deployment of current least cost technology throughout BellSouth's network. He further contends that the outdated equipment reflected in BellSouth's historical costs is more costly to operate. With modern equipment, he believes that network surveillance can be executed from a central facility, which will provide substantial savings. In addition, he argues that competitors will perform some of the customer interface portion of repair activities that result from customer trouble reports and related plant administration

work. He predicts BellSouth will experience a decrease in its network operating expenses of approximately 10 per cent because of this.

Witness Lerma also bases his proposed reduction in network operating expenses on a trend analysis of BellSouth's expenses per access line for accounts 6530 and 6512 for the period 1989 to 1996. He contends that over this period, BellSouth's expenses in these accounts decreased by approximately 47 per cent. Based on a combination of these indicators, he proposes that BellSouth's network operating expenses be reduced by 50 per cent.

BellSouth witness Reid agrees that BellSouth will reduce its network operating expenses in a competitive forward-looking environment. He states, however, that BellSouth has already accounted for such reductions in its cost study.

Conclusion

We agree with both AT&T/MCI and BellSouth that without question the use of forward-looking least cost technology will have the effect of reducing network expenses. We do not accept, however, either BellSouth's or AT&T/MCI's treatment of General & Administrative expenses and network operational expenses. Witness Lerma contends that the use of network surveillance equipment will reduce BellSouth's network operating expenses, but he concedes that he does not know whether BellSouth even has the appropriate equipment available to perform network surveillance from a central facility in Florida. In fact, he acknowledges that he relies on other witnesses' conclusions that reductions in expense levels will result from the introduction of new technologies in the future. Furthermore, he observes that these witnesses provide no specific information regarding the new technologies presumably to be introduced or to what degree expense levels would be reduced as a result. He further concedes that he does not know what equipment exists today in BellSouth's network or the capabilities of BellSouth's existing network.

As noted, AT&T/MCI also argue that competitors will perform some of the customer interface activities. However, AT&T/MCI did not have Florida-specific information regarding customer interface costs. As a result, witness Lerma uses average data from South Carolina, Alabama, Louisiana, and Tennessee to derive an estimated decrease in network operating expense of 10 per cent. Nevertheless, we do see that competitors may in the future handle some of the customer interface activities.

Witness Lerma bases his proposed reduction in network operating expenses in part on a trend analysis of BellSouth's expenses per access line for accounts 6530 and 6512 for the period 1989 to 1996. As noted, he contends that over this period BellSouth's expenses in these accounts decreased by approximately 47 per cent. He contends that approximately 80 per cent of his proposed 50 per cent reductions in these accounts is based on this analysis. He asserts that the other 20 per cent is associated with the reduction of customer interface costs.

AT&T/MCI also base their proposed reductions of BellSouth's General & Administrative expenses on a trend analysis of BellSouth's expenses per access line for accounts 6710 and 6720. As we have noted, witness Lerma asserts that ARMIS data for 1989 through 1996 for the RBOCs indicate that decreases in General & Administrative expenses per line ranged from 22 per cent to approximately 54 per cent, while BellSouth experienced a decline of 22.4 per cent. This decrease in expenses per access line leads us to our conclusion that BellSouth will most likely reduce its network operational expenses and General & Administrative expenses on a going forward basis.

As we have also noted, witness Lerma relies in part on the experience of the post-deregulation railroad industry, which experienced large reductions in General & Administrative expenses in the period 1983 to 1995. We do not see in this record, however, how the deregulation effects in the railroad industry relative to these expenses can be reasonably related to similar effects in the telecommunications industry. Therefore, we do not accept witness Lerma's assertion that the deregulated railroad industry's experience is somehow support for the contention that BellSouth will experience a reduction on the order of 27 per cent in General & Administrative expenses in a competitive environment.

The evidence in this record shows that BellSouth has experienced some reductions in both its network operations and General & Administrative expenses that we expect will be carried forward. BellSouth has accounted for some productivity savings based on a decrease from 40 to 28 in its number of employees per 10,000 access lines from 1992 through 1996, reflecting in part its efforts to carry out its planned 11,300 work force reduction. As we have noted, BellSouth proposes an approximately $84 million reduction in the 67xx accounts related to its work force reduction. We recognize that BellSouth has reduced its expense levels, but we are persuaded that reductions beyond those it has accomplished and those it plans can and should be made.

The assumptions of AT&T/MCI and BellSouth as they relate to shared and common costs support decidedly different views of what is achievable by an efficient forward-looking, least cost network. AT&T/MCI's model of an efficient forward-looking least cost network is represented by the Hatfield model, which uses a "bottom up," "scorched node" approach. Witness Lerma described a "bottom up" approach as one in which long-run incremental costs are built from the ground up. In other words, the approach envisions purely future costs. BellSouth's approach takes the network BellSouth has in place and modifies it to appropriately reflect least cost technology on a going forward basis, that is, it adjusts present costs. We note, moreover, that most of the UNEs at issue in these proceedings are monopoly elements that do not currently face significant competition. A CLEC has no choice other than to go to the ILEC to obtain them.

BellSouth and AT&T/MCI do agree that some shared and common costs are appropriate based on forward-looking, least cost principles. We do not find, however, that either reasonably identifies the level of overhead costs to be attributed to UNEs in these proceedings. Indeed, the level of shared costs proposed to be associated with the recurring UNE charges in these proceedings ranges from approximately 5 per cent to 25 per cent. Moreover, the level of shared costs associated with the non-recurring UNE charges ranges from approximately 30 per cent to 40 per cent. In light of such cost-saving measures as BellSouth's continuing work force reduction and its reductions in network operating expenses and General & Administrative expenses, overhead costs for BellSouth ranging from 5 per cent to 40 per cent appear to us to be excessive, especially in a prospective environment where new entrants are competing vigorously for BellSouth's customers. Upon consideration, we conclude that neither the levels of overhead proposed by BellSouth nor the levels proposed by AT&T/MCI are appropriate for setting UNE rates in a competitive environment.

Our purpose in these proceedings is to establish the appropriate methodologies to be incorporated in the cost models to set UNE rates. We believe that only a reasonable amount of overhead costs should be reflected in the cost studies used to set UNE rates in these proceedings. The derivation of shared and common costs, moreover, should be based on an efficient forward-looking network. We recognize that with local competition, BellSouth will need to become more efficient. Thus, based on the reasons stated above and the evidence in this record, we require BellSouth in its shared and common cost model to reduce its network operating expenses in accounts 6531 to 6535 and 6512 by an

additional 30 per cent, and its General & Administrative expenses in accounts 6711 to 6712 and 6721 to 6728 by an additional 15 per cent.

Recovery of LCSC

BellSouth includes the recovery of the cost associated with its LCSC in the development of its proposed shared and common cost factors. The LCSC was designed specifically for the CLECs' use to process the local service order for provisioning. According to AT&T witness Lynott, because the LCSC work group is dedicated to performing the ordering and provisioning processes for the CLECs, BellSouth claims that it should not have to absorb the costs for this center. AT&T/MCI contends that BellSouth includes $15,536,528 in new expenses, and arbitrarily assumes that 25 per cent are recurring and 75 per cent are non-recurring in nature. AT&T/MCI asserts that none of the expenses of this new center should be reflected in the UNE prices that are being established in these proceedings. We agree.

Conclusion

As we discuss in Part V, we granted a motion to strike all testimony and exhibits in these proceedings pertaining to the costs of manual and electronic Operations Support Services (OSS) functions. We therefore make no finding at this time concerning the propriety or reasonableness of these costs. BellSouth's LCSC costs are attributable to its OSSs and thus must be excluded from recovery at this time.

Shared Labor Factors

BellSouth's proposed shared labor factors reflect the relationship between shared costs and labor costs. Witness Reid explained that BellSouth develops these factors to calculate its loaded labor rates. BellSouth first calculates its direct labor rates by dividing total 1995 salaries, wages and benefits by total hours worked for each work force group that it analyzed. This results in a 1995 direct labor rate. BellSouth then inflates its direct labor rate by approximately 3 per cent to obtain the 1996 direct labor rate. To obtain 1997 to 1999 direct labor rates, BellSouth multiplies the 1996 direct labor rates by an inflation factor that ranges from 3.5 per cent to 4.1 per cent a year.

Next, according to witness Reid, BellSouth accumulates shared costs attributed to salaries and wages for each of the work force groups. BellSouth then develops a shared labor factor for each work force group by dividing the attributed shared costs, e.g., human resources, office equipment, land and building space, and motor vehicles, by the direct salaries and wages. The shared labor factor is then multiplied by the direct salary and wage portion of the incremental labor rate factor for each work force group. To determine the TELRIC labor rate, BellSouth adds the result to the incremental labor rate. BellSouth then uses the TELRIC labor rates so derived to determine the non-recurring costs related to UNEs.

AT&T/MCI witness Lerma argues that BellSouth's shared labor rates should be rejected since they treat recurring costs as non-recurring costs. He also believes that BellSouth is incorrect in assuming that recurring wholesale expenses in accounts and cost pools that are attributed based on salary and wages should be recovered through the shared labor rate factors, with the resulting labor rates subsequently used to determine the non-recurring rates. He asserts that these "TELRIC" labor rates are key in the development of BellSouth's non-recurring rates, and in some cases increase the labor rate by approximately 50 per cent. Furthermore, AT&T/MCI contends that the recovery of recurring costs in non-recurring rates creates barriers to entry for CLECs. Witness Lerma acknowledges that some of the costs in certain cost pools may include some increment of non-recurring costs, but he contends that BellSouth does not provide the information necessary to determine these increments.

For instance, witness Lerma states that in BellSouth's model, the wholesale expenses factor for all cost pools in Account 2112 (Motor Vehicles) is attributed based on salary and wages. This means that the amounts in Account 2112 are to be recovered in the shared labor rate factors that produce the shared labor cost portion of BellSouth's TELRIC labor rates. Subsequently, these labor rates are used to determine non-recurring costs. He contends that if the amounts in Account 2112 are recurring costs, then they should be recovered in recurring rates. Thus, each of the cost pools in Account 2112 should be attributed on some cost-causative basis other than salary and wages. While witness Lerma discusses Account 2112 as an example, he believes there are numerous other accounts with cost pools that include recurring costs similar to Account 2112.

BellSouth witness Reid states that AT&T/MCI's concern regarding BellSouth's attribution approach is merely a difference of opinion between AT&T/MCI and BellSouth concerning what are recurring costs and what are non-recurring costs. Also using Account 2112 as an example, witness Reid explains that if a non-recurring task is performed and a motor vehicle is used in performing that task, then a portion of the motor vehicle cost should be attributed to that non-recurring task.

To reflect AT&T/MCI's concern with BellSouth's attribution process in its shared and common cost model, witness Lerma provides an adjustment to BellSouth's shared labor factors. His proposed adjustment provides alternative attribution bases for those cost pools that BellSouth attributed using salary and wages. The adjustment has the effect of reducing the shared labor factors to zero and shifts recovery of those costs to the shared cost factors. AT&T/MCI contends that its adjustment does not prevent BellSouth from recovering any of the costs for these cost pools. We note that AT&T/MCI proposes adjustments to BellSouth's proposed shared labor rates, but witness Lerma instead argues that the labor rates reflected in the AT&T/MCI Non-recurring Cost model are the appropriate labor rates.

BellSouth treats as shared labor costs all expenses that it attributes on the basis of salaries and wages. On this assumption, BellSouth assigns the costs in the associated accounts to the labor rates used to develop non-recurring costs. We believe that some portion of these costs should be attributed to labor based on salaries and wages. We are unable to verify, however, what portion of non-recurring cost should be included and whether all of the recurring expenses have been excluded. Upon consideration, we find that BellSouth does not provide the information we need to determine the amounts in these accounts that could be attributed to non-recurring functions.

We find that it is appropriate for the non-recurring costs directly associated with a UNE, for example, labor rates or travel times, to be recovered in the non-recurring charges. We recognize that some portion of the shared expenses that BellSouth attributed on the basis of salaries and wages costs may be attributed to the labor associated with non-recurring events. We are, as we stated above, unable to verify what portion of non-recurring costs should be included and whether all of the recurring expenses are excluded. For purposes of these proceedings, we do not find it appropriate to permit overhead costs related to non-recurring activities to be recovered in non-recurring charges. Based on the evidence, it

appears that such recovery through non-recurring charges could create a barrier to entry. We do, however, recognize that this may not always be the case. Nevertheless, we believe that CLECs who face high non-recurring charges that must be paid to attract each new customer may be reluctant to enter the telecommunications market in Florida for that reason.

Conclusion

For these reasons, we find it appropriate for shared costs to be reflected by means of the shared cost factors. These costs shall not be associated with labor rates. This does not prohibit BellSouth from recovering these costs. It merely shifts the recovery of these costs from non-recurring rates to recurring rates. We find further that the use of AT&T/MCI's proposed attribution adjustments for those cost pools using salary and wages is appropriate. This attribution basis shifts recovery from the shared labor rate factors to the shared cost factors.

E. Residual Recovery Requirement

BellSouth

In its rate proposal, BellSouth identifies three rate components, TSLRIC, shared and common costs, and historical costs. BellSouth refers to the historical component as its RRR. BellSouth defines RRR as the difference between TSLRIC plus shared and common costs, or the "theoretical costs," and the "actual cost" of providing a network element.

BellSouth bases its claim to include RRR in its rates on its interpretation of the Act. According to BellSouth witness Varner, the Act states that BellSouth may include a reasonable profit in setting its rates. He asserts that BellSouth cannot make a "reasonable profit" unless its rates recover historical costs. Thus, he concludes that the Act anticipates that rates will recover, at a minimum, the actual costs of the firm.

BellSouth applies the RRR only to loops and ports in these proceedings. Witness Varner explains that loop and port plant investment represents the greatest discrepancy between actual and forward-looking costs. He states that approximately 70 per cent of BellSouth's plant investment is in loops and ports. Although BellSouth could calculate the RRR for elements other than loops and ports, witness Varner states that it has not done so only in order to simplify these proceedings.

Witness Varner insists that this treatment is not discriminatory because all CLECs ordering unbundled loops and ports will pay the same rate. Because the CLECs will be incurring the same costs that BellSouth itself incurs, he maintains a pricing structure including a RRR is not discriminatory. He testifies that BellSouth, no less than CLECs, would be unlikely to invest in new facilities because it would not be recovering the full amount of the new facility's cost without recovering a RRR.

AT&T/MCI

AT&T/MCI witness Selwyn testifies that recovery of historical costs is prohibited under the Act, because the RRR represents the costs that have been determined in a rate of return or other rate based proceeding, which in pricing UNEs is prohibited by Section §252(d)(1)(A)(i) of the Act.

AT&T/MCI witness Wood asserts that by including the RRR as part of its cost recovery, BellSouth concedes that it has an inefficient network or excessive overhead costs, or both. He maintains that BellSouth would see its competitors, even if they are more efficient, be saddled with BellSouth's excessive cost structure. Witness Wood further testifies that, in effect, BellSouth wants to be made whole, as if it were still a rate of return regulated carrier, while still maintaining the freedom of price regulation. He also argues that BellSouth's application of the RRR only to loops and ports is discriminatory and in violation of Section §252(d)(1) of the Act.

WorldCom

WorldCom witness Porter testifies that BellSouth's RRR is a blatant attempt to recover its embedded costs. He cites two Commission orders that he maintains do not permit historical costs to be recovered. These orders, Order Nos. PSC-96-1531-FOF-TP and PSC-96-811-FOF-TP, he states, conclude that under TSLRIC methodology, BellSouth's cost studies are to consider the current architecture of the network and future replacement technology.

Conclusion

This is not the first time that BellSouth has argued that it must recover historical costs. In Docket No. 950696-TP, In Re: Determination of Funding for Universal Service and Carrier of Last Resort Responsibilities, BellSouth presented a similar argument.

In that docket, in Order No. PSC-95-1592-FOF-TP, at pages 26 and 27, we found that:

> It also appears that SBT's attempt to recover its "past COLR investment" may be anticompetitive. By including this "past COLR" component in its proposed mechanisms, SBT has essentially requested that it be made whole in the face of impending competition. If SBT wishes to be assured of the opportunity to recover its "past COLR investment," it could have remained under rate of return regulation. [footnote omitted]

The FCC has not yet decided the question of recovery of historical costs. In its order on Access Charge Reform, FCC 97-158, the FCC did, however, defer a resolution of the historical cost issue, stating at ¶14 that:

> A separate order in this docket will also address "historical cost" recovery: whether and to what extent carriers should receive compensation for the recovery of the allocated costs of past investments if competitive market conditions prevent them from recovering such costs in their charges for interstate access services.

As of the date of our decision, the FCC had still not addressed historical cost recovery.

Upon consideration, we conclude that BellSouth's RRR scovhall not be permitted in these proceedings, because recovery of embedded costs is inappropriate in a forward-looking cost model. We agree with AT&T/MCI that by including the RRR in its proposed rates for loops and ports, BellSouth appears to desire to be made whole as if it were a rate of return regulated company, while enjoying the benefits of price regulation. Furthermore, as we have noted above, we earlier concluded that past COLR investment shall not be recovered in a universal service mechanism.

Takings

BellSouth argues that if it is unable to price loops and ports to recover the cost of its investment, then its property is being confiscated. BellSouth maintains that compelling it to provide UNEs

and interconnection to CLECs is a taking of its property for which it is constitutionally guaranteed the right to fair compensation.

BellSouth argues that it enjoys the protections of the Fifth and Fourteenth Amendments of the U.S. Constitution and Article I, Section 9 and Article 10, Section 6 of the Florida Constitution against the taking of its property. BellSouth cites FCC v. Florida Power Corp., 480 U.S. 245, 107 S.Ct. 1107, 94 L.Ed. 2d 282,[1] in support of its claim that it has a constitutional right to fair compensation for providing UNEs and interconnection to CLECs. BellSouth contends that it should have, at the very least, a reasonable opportunity to recover its actual costs.[2]

We note that this constitutional issue was raised by BellSouth for the first time in its brief of the evidence. Thus, no other parties had the opportunity to address it. Accordingly, we will make no finding regarding that matter. We do note the following for informational purposes only.

The U.S. Supreme Court has addressed utility claims of unconstitutional takings in the rate of return regulation environment on several occasions. See, e.g., Chicago, Minneapolis & St. Paul R.R. v. Minnesota, 134 U.S. 418, 10 S.Ct. 462, 33 L.Ed. 970; Willcox v. Consolidated Gas Co., 212 U.S. 19, 29 S.Ct. 192, 53 L.Ed. 382; Bluefield Co. v. Public Service Commission, 262 U.S. 679, 43 S.Ct. 675, 67 L.Ed. 1176; Board of Public Utility Commissioners v. New York Telephone Co., 271 U.S. 23, 46 S.Ct. 363, 70 L.Ed. 808. The Court has held in each of these cases that rates set so low as to deny an adequate rate of return are confiscatory.

In the present competitive era established by the Act, rate of return regulation has, of course, been supplanted by market dynamics. New entrants are required to reach interconnection agreements with incumbent local exchange companies, either through negotiation or arbitration, that include only nondiscriminatory

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[1]The holding in this case was based on Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982). There, the court held that a permanent physical occupation authorized by government is a taking without regard to the public interests that it may serve. Id. at 426. When that is the case, as it is here, what remains to be decided is the Fifth Amendment issue whether compensation is just.

[2]BellSouth notes that when these same constitutional concerns were raised in the appeal of the FCC's First Report and Order, CC Docket No. 96-98, the U.S. Court of Appeals for the Eighth Circuit held that the claims were not ripe for review.

rates based on forward-looking costs. In these proceedings, we establish permanent rates for a number of UNEs for which we earlier approved only interim rates. The permanent rates we establish are derived using a TSLRIC methodology. This methodology reflects efficient, forward-looking costs, including a reasonable amount of shared and common costs. We sanctioned the TSLRIC methodology in Order No. PSC-96-1579-FOF-TP as the appropriate methodology for establishing rates for UNEs. It is a methodology fully consistent with the pricing standard for UNEs defined in Section 252(d)(1) of the Act. Section 252(d)(1) requires that rates be based on cost without reference to a rate of return or other rate-based proceeding.

In Iowa Utilities Bd., 120 F.3d 753, the court responded to the challenge of the ILEC's that the FCC's unbundling rules provided CLECs with such extensive access to and use of the ILEC's networks as to effect unconstitutional takings of the ILEC's property. The court stated that it was skeptical that the unbundling rules that it had not vacated would effect a taking. Since it had also vacated many of the FCC's pricing rules, the court held that it could not presently determine whether the ILECs are receiving or will receive just compensation for providing competing carriers with access to their networks. Id. at 818. The court ruled that an ILEC could raise a ripe takings claim only if it has submitted the issue of rates for unbundled access to a state commission in an arbitration proceeding. Id.

F. Disconnect Costs - Non-recurring Charges

BellSouth

BellSouth proposes to include the costs of disconnection (disconnect) in its non-recurring charges for installing UNEs. These costs thus would be recovered "up-front" at the time of installation of service. The customer would be billed in the present for work to be done in the future. Disconnect costs would be discounted to recognize the time value of money and would be based on the estimated location life of the UNE installed. In the TELRIC Calculator, the disconnect work time is multiplied by the applicable labor rate, and a discount factor is applied to account for the fact that the work is performed in the future. This disconnect cost is then added to the calculated costs for installation, and the sum is the non-recurring charge for the UNE.

According to BellSouth witness Caldwell, disconnect factors are translators used to determine the costs associated with disconnecting a service. The calculation of discount factors is based on the expected life of the service and the highest interest rate that BellSouth is required to pay its customers for customer deposits, in this case, eight percent. The disconnect factor inflates the labor cost to the period of the future disconnect and then discounts this cost to the present. Witness Caldwell states that BellSouth uses 1996 forecasted labor inflation rates in its calculations of discount factors. She further states that BellSouth determines the time period for discounting, or location life of the element, based on historical data for inward and outward movement. She states that she does not believe that the introduction of competition would affect the frequency of in and out movement.

BellSouth witness Landry states that in its cost studies BellSouth recognizes the price of DOP. For example, when a disconnect order comes through for a 2-wire loop to a customer's premises, the loop is not physically disconnected. Thus, there would be no travel or work time to dismantle the circuit. Witness Landry states further that more complex circuits would require such work activity to recover equipment located at the customer premises. He also states that, after 12 months, if the facility has not been placed in service, it would be processed for reuse.

AT&T/MCI

AT&T/MCI opposes recovery of disconnect costs "up-front," arguing that this can lead to over-recovery of costs. For example, in a loop migration scenario, AT&T/MCI notes that disconnect costs were already recovered from the ILEC end users at the time of installation. Moreover, it disagrees with BellSouth's estimate of location lives.

AT&T/MCI witness Lynott proposes instead that disconnect costs be modeled separately, and that the CLEC pay for them only at the time such activity is physically performed. For example, if a CLEC end-user moved out of the premises, the CLEC may elect to leave the circuit in place as Dedicated Inside Plant and Dedicated Outside Plant (DIP/DOP), retaining soft dial tone for the next customer. In such situations, the CLEC would not have to pay to have the cross-connect in the central office disconnected or removed until the work is actually done.

Conclusion

Recovery of disconnect costs at the time of installation is standard practice in LEC end user local service tariffs. This is because it is commonly thought that end users understand and accept installation charges more readily than they do disconnection charges. We find, however, that this practice is unnecessary for CLECs. Disconnection of UNEs does not mean necessarily the end of a contractual relationship with the ILEC. Moreover, when a CLEC requests disconnection of a loop, BellSouth may not actually physically disconnect the line. Yet BellSouth has modeled the NRCs to include physical disconnect for every installation.

Based on the evidence in this record, we conclude that disconnect costs shall not be included in the non-recurring installation charges approved in these proceedings. Eliminating disconnect costs from up-front NRCs is a logical way to relieve some of the burden associated with high start-up costs. CLECs understand and accept that disconnect costs exist, and we believe it is more appropriate to assess those charges at the time the costs are in fact incurred. According to AT&T/MCI, this would also solve the problem of the dispute over location lives. Parties should have the opportunity to negotiate the method by which disconnect costs are calculated and recovered. Therefore, work times, labor rates, and discount factors that make up the calculations of disconnect costs shall be excluded from the calculation of installation costs that determine the non-recurring charges.

IV. SPECIFIC UNBUNDLED NETWORK ELEMENTS

A. Network Interface Device

Element Description

The FCC's rules define the NID as a cross-connect device used to connect loop facilities to inside wiring. 47 C.F.R. §51.319(b)(1)) Incumbent LECs are required to permit requesting telecommunications carriers to connect their own loops to the inside wiring of customer premises through the incumbent LEC's NID. If spare capacity exists, a CLEC can connect its own loop directly to BellSouth's NID. According to BellSouth's witness Caldwell, where spare capacity does not exist, BellSouth can replace that NID with another NID with additional capacity or a second NID can be installed with a cross-connect wire tying the two together. The second NID would belong to the CLEC and could be installed by the

CLEC itself, or the CLEC could request BellSouth to install the NID. Therefore, we will set rates for the following elements or functions:

- NID
- NID to NID cross connect
- BellSouth installation of a CLEC NID

Recurring Charges

AT&T/MCI uses BellSouth's Loop Model and the TELRIC calculator for their recurring and non-recurring cost development. Of these three elements or functions, only the NID requires a recurring charge. Only non-recurring charges apply to the NID to NID cross connect and to the installation (by BellSouth) of a CLEC NID.

AT&T/MCI proposes several corrections to BellSouth's cost inputs for the BellSouth NID recurring charge. First, AT&T/MCI claims that BellSouth has excessive Bridge and Station Protector investment amounts. AT&T witness Wells states that a station protector has capacity for two voltage protection devices, and the 2-wire NID has capacity for two station protectors. Witness Wells states that BellSouth modeled two station protectors for each customer, because of BellSouth's assumption that it serves more than one line, but less than two lines, per customer. Witness Wells asserts that BellSouth should eliminate the difference in station protector investment between the average number of lines that BellSouth models per customer (two lines) and the average number of lines BellSouth claims it serves per customer.

BellSouth witness Caldwell disagrees with witness Wells' logic. She states that if there is an average of one and a quarter lines per customer, then two protectors would have to be modeled.

Upon review, we have determined that witness Wells' calculation considers the protector investment necessary to serve the total number of lines that BellSouth claims it provides. His calculation uses BellSouth's number of lines, customers and investment amounts. Only his application of these numbers in the calculation is different from BellSouth's analysis. We follow the logic in witness Wells' calculation of the protector investment and find it to be appropriate. His calculation is reasonable and better reflects the actual station protection per customer location than does BellSouth's calculation.

Second, witness Wells addresses estimated work and travel times associated with the BellSouth NID. It appears that BellSouth has capitalized the costs of travel and labor work to install the NID. We note that costs for materials are generally capitalized and recovered in recurring rates, while one-time costs to service an order are often recovered in a one-time, up-front charge. We also note that we are aware that a company could propose a new service with up-front costs for service installation so great as to be a deterrent to competitive entry. In such cases, to make the service more appealing, the company may propose a lower non-recurring charge, attempting to recover those costs in the monthly recurring rate. When a company makes this type of rate proposal, the company often requires a multi-year contract with a termination liability. In this way, it is possible to recover charges for non-recurring functions in the recurring charge. We believe that the recovery of the NID installation labor and travel costs in the recurring charge is unusual, but neither AT&T nor MCI opposed it. AT&T witness Wells only proposed reductions to the travel and work times, not the removal of these costs from the recurring charge and subsequent placement into the non-recurring charge.

It appears to us that the work and travel times proposed by BellSouth are those that BellSouth incurs when it originally installs its NID. Witness Wells asserts, however, that those work and travel times for the NID are excessive. He states that when BellSouth installs the NID, it also terminates the loop at the NID. Therefore, he argues that the travel time should be shared by the two functions.

We believe that witness Wells's analysis is correct, because when a CLEC orders BellSouth's NID, the CLEC is not using BellSouth's loop. This is because the NID is already included as an element in the loop. It does not make sense to us for a CLEC to order a stand-alone NID if it is going to use a BellSouth loop. The full travel time is appropriate in the cost to install a NID only when BellSouth installs a new NID for a CLEC, which then becomes the CLEC's NID.

Witness Wells states that if no BellSouth NID exists at an end user's premises, then it is more likely that the CLEC would install a new NID itself rather than incur the cost to have BellSouth do it. Therefore, we find it appropriate to split the travel time between the NID installation and drop wire connection functions. Witness Wells proposes allocating 15 minutes of travel time to the NID. This is more than half of the time proposed by BellSouth for

travel. We find that 15 minutes is appropriate for an existing BellSouth NID that is ordered on a stand-alone basis.

AT&T's proposed work times appear to reflect the "best case" scenario for the least time expended to perform the travel, set-up, connect and test, and tear-down functions. BellSouth proposes work times that it believes are appropriate to perform the same functions. These proposals represent spectrum boundaries. All of the work times were estimated by subject matter experts. Record evidence in these proceedings supports neither proposal. We conclude therefore that the appropriate work times must fall somewhere in this spectrum.

Upon consideration, we find it appropriate to reduce BellSouth's proposed work times by 25 per cent of the difference between BellSouth's and AT&T's proposed work times. We are persuaded to weight the work times in favor of BellSouth, because BellSouth's technicians actually perform these duties on a regular basis. Thus, BellSouth not only has the opinion of its subject matter experts regarding the work-times, but also the real-world experience of its technicians.

Non-recurring Charges

BellSouth NID

We understand that when a CLEC orders BellSouth's NID as an unbundled network element, the NID is not actually unbundled. The NID is in place and there is no need to disconnect and re-connect anything. The NID is, essentially, two connections. One is the connection between the NID itself and the inside wire of the end user's premises. The other connection is between the NID and the drop wire, which is the last portion of the loop on the end user's end. A CLEC would only use BellSouth's NID on a stand-alone basis when the CLEC provides its own loop to the end user premises. The 2-wire NID has the capacity to terminate two loops. Not only does the NID provide a point of connection between the inside wire and the loop, but it also provides the point where the loop can be grounded.

The cost studies provided by BellSouth and AT&T/MCI both contain only one non-recurring job function, that is, Service Order Processing. We have, however, excluded all service order-related charges from these proceedings. There is no charge for any other function, because none are performed on a non-recurring basis.

Therefore, we find that there is no non-recurring charge for the BellSouth NID.

NID to NID Cross Connect

BellSouth proposes a NID to NID cross connect non-recurring charge based on a connect and test time of 0.1667 hour, while AT&T/MCI proposes one based on 0.0333 hour. There is minimal evidence in the record to support either proposal. Hence, for consistency, we apply the same judgment as we applied to the work times relating to recurring charges associated with the NID. We reduce BellSouth's proposed work times by 25 per cent of the difference between BellSouth's and AT&T's proposed work times, arriving at 0.1334 hour as the NRC basis for this function.

Installation of CLEC NID

BellSouth proposes a CLEC NID installation non-recurring charge based on a connect and test time of 0.7500 hour and a travel time of 0.3667 hour, while AT&T/MCI proposes one based, respectively, on 0.4167 and 0.5000 hour. We accept BellSouth's proposed travel time. AT&T/MCI's proposed travel time is greater than BellSouth's, but we find that BellSouth's estimated travel time is the better number because BellSouth, having actual travel time records, is likely to have better information than AT&T/MCI for this function.

There is also an inconsistency in AT&T's analysis of the costs associated with the installation of a CLEC NID. Witness Wells analyzes the costs associated with the BellSouth NID element, and AT&T witness Lynott analyzes the costs associated with the cross connect and the CLEC NID installation. The AT&T witnesses use different work times for the connect and test functions. BellSouth proposes 0.7500 hour to install and test the CLEC NID. Witness Lynott proposes 0.0708 hour, but witness Wells proposes that BellSouth should allocate no more than 0.4167 hour in the recurring charge analysis for NID installation. The time to install a BellSouth NID or a CLEC NID should be the same. We find that the work time proposed by witness Lynott is unreasonably low for the work required to install a NID and the work time proposed by BellSouth is unreasonably high. Therefore, we once again use the rationale we applied to the work times relating to recurring charges associated with the NID and shall reduce BellSouth's proposed work time by 25 per cent of the difference between its proposed work time and AT&T witness Well's proposed work time,

arriving at a work time of 0.6667 hour as a basis for a connect and test NRC.

Conclusion

Based on the evidence in this record, we, upon consideration, find that for the BellSouth NID, a recurring rate of $1.08, for the first and each additional installation, is appropriate. BellSouth proposes a rate of $1.44 and AT&T/MCI, $0.62. Although BellSouth proposes a non-recurring charge of $5.59 and AT&T/MCI, $5.72, we find that a non-recurring rate for the BellSouth NID is not applicable.

We find further that for the NID to NID cross connect, a non-recurring charge of $6.15, first and each additional, is appropriate. BellSouth proposes $10.19 and AT&T/MCI, $0.78. We find that a recurring charge for this function is not applicable and none is proposed by the parties.

We find further that for the CLEC NID installation by BellSouth, a non-recurring first charge of $70.32 and each additional charge of $54.35 are appropriate. BellSouth proposes $116.68 and $72.71, respectively, and AT&T/MCI, $50.42 and $28.29, respectively. We find that a recurring charge for this function is also not applicable and none is proposed by the parties.

B. 2-wire and 4-wire Loop Distribution

Element Definition

BellSouth provides the following definition for 2-wire and 4-wire Loop Distribution:

> Unbundled 2-wire and unbundled 4-wire analog voice grade sub-loop distribution include all outside plant from the Serving Area Interface (SAI) to the end user customer's premises. Two-thirds of the SAI, 26 gauge copper cable to the customer's premises and the cable, up to and including the NID, are included.

Exhibit 13 Part 2 at 1.

The SAI is also known as the Feeder Distribution Interface (FDI) and as the crossbox. Twenty four gauge cable may also be required to meet transmission standards. The remaining one-third of the SAI is allocated to feeder cable.

Recurring Charges

Construction of the Loop Sample

BellSouth witness Caldwell states that BellSouth has constructed a statistically valid loop sample drawn from a 1995 universe consisting of residence and business access lines. AT&T/MCI witness Ellison and WorldCom witness Porter argue that BellSouth's sample incorrectly excluded shorter length, and thus lower cost loops, such as ESSX and business trunks. Witness Ellison asserts that BellSouth's loop study is "fatally flawed" because the "design of the loop cost model is defective." He further argues that BellSouth's study procedure served to increase BellSouth's loop costs because, among other things, the loop sample excluded the lowest cost loops, such as ESSX. He also argues that the sample itself is too small, and thus fails to capture the "wide range of values from loop to loop."

WorldCom witness Porter also objects to the exclusion of loops for ESSX and business trunks, "loops that would make their loop costs significantly lower than what they are proposing here." Nonetheless, he states that "we can live with that even though it's not right."

Witness Caldwell testifies that BellSouth excluded these types of lines because "they are typically purchased in bulk to a single location. Therefore, BellSouth assumed that the CLEC would choose the more economical method of serving those types of lines via a DS1, DS3 or other high capacity service rather than via multiple unbundled analog voice grade loops."

We can agree with AT&T/MCI that the inclusion of ESSX and business trunks would result in a sample of business lines with shorter loop lengths. We would have preferred that the universe used to draw these samples include all loops. However, we also agree with BellSouth that if a CLEC were to serve these types of lines, it would likely use DS1s or DS3s to serve these customers because they are more economical. We find, therefore, that BellSouth's loop sample construction is appropriate.

Recasting the Loop Sample

Witness Caldwell states that after BellSouth developed its loop sample, it then examined each loop to see if it met its criteria for the most forward-looking, most efficient technology. She states that if a loop did not meet those criteria, the loop was "recast" so that it did. As an example of recasting, she states that "if a loop was 15,000 feet long, but was on copper, we recast the feeder part of the loop to put it on fiber, which is the medium of choice for a loop over 12,000 feet." Transcript at 322.

AT&T/MCI witness Wood argues that it is not possible to "transform embedded characteristics into forward-looking ones," because these attempts "ignore the fact that what BellSouth has done historically is simply not very useful as an indicator of what an efficient carrier should do going forward." (emphasis in original) He continues:

> In order to calculate forward-looking costs, therefore, it is necessary to use a true 'bottoms up' approach to costing: identify the relevant cost drivers (demographic and geographic characteristics) of the area being studied, and by applying accepted engineering prices design the forward-looking network needed to provide the cost object (UNEs or retail services, for example) being studied. It is extremely difficult (and maybe impossible) to begin this process by studying the embedded network without inappropriately carrying forward embedded characteristics.

Transcript at 1717-1718.

AT&T/MCI's foundation for a forward-looking, least cost network is the Hatfield model, which, as we have noted, we have not accepted. AT&T/MCI witness Wells agrees that at least four of AT&T/MCI's outside plant assumptions parallel those of the Hatfield model, i.e., fill factors for feeder and distribution, structure sharing, and bridged tap.

Witness Porter accepts BellSouth's loop design. He states, however, that it is not the loop standard WorldCom would propose.

We consider the CLECs' loop design criticisms further below.

Digital Loop Carrier

In its network design for the loop model, BellSouth witness Baeza states that BellSouth includes the use of universal Digital Loop Carrier(DLC) as forward-looking technology. AT&T/MCI witness Gillan argues that to the contrary integrated DLC represents forward-looking technology.

DLC is technology that permits a LEC to serve more customers than would otherwise be possible over the same number of copper pairs by multiplexing individual loops on to DS1s. In universal DLC systems, each loop is terminated individually at the main distribution frame. Integrated DLC systems terminate each DS1 directly into the switch.

BellSouth witness Caldwell states that BellSouth includes DLC only to calculate the RRR. We have found that the RRR is inappropriate in these proceedings. Hence, we decline to address the universal DLC - integrated DLC controversy.

Use of 26 Gauge Cable

According to witness Baeza, BellSouth's loop study models a network design that assumes the use of 26 gauge cable. AT&T/MCI witness Wells also uses that assumption. We find this assumption to be reasonable and we therefore approve it.

Structure Sharing

Structure sharing occurs when an ILEC shares outside plant structures, such as poles, conduit, and trenches, with other utilities, such as electric companies, cable television companies, or CLECs. Structure sharing means cost sharing. Therefore, the more structures an ILEC shares, the lower its overall structure cost is likely to be.

Witness Wells argues that "BellSouth's Cost Study does not incorporate a forward-looking view of structure sharing in a competitive environment where there will be greater opportunities and incentive for telecommunications companies to share pole lines, trenches and conduit runs."

BellSouth witness Baeza states that because of the requirements of the Act, the "cost causer" must pay for any rearrangement. He asserts that even though joint pole use is the most common arrangement, it is not always possible. High voltage lines on electric company poles cause interference with telecommunications and, therefore, make sharing impossible. Further, he asserts that with trenching, timing is the critical issue. Many times, he states, power is needed first in a development, and therefore "it would be a poor economic decision to place investment that will not be used just to joint trench." He states that BellSouth, then, will not joint trench unless it can place investment that it will use. In terms of joint use of conduit, he states that BellSouth owns the "vast majority" of conduit it uses in its operations.

We are not persuaded by AT&T/MCI's argument that a competitive environment will encourage more structure sharing, at least in the foreseeable future. Therefore, we find it appropriate to accept BellSouth's structure sharing assumptions.

Fill Factor

A utilization or fill factor describes the per centage of the plant that is in use. BellSouth uses the terms "utilization factor" and "fill factor" interchangeably. BellSouth defines the utilization factor as the number of assigned cable pairs divided by the number of available cable pairs.

AT&T/MCI witness Wells defines utilization and fill factors differently. Witness Wells uses a fill factor definition from "bottom up cost models," such as the Hatfield model. In his definition, the fill factor is the percent of the lines served divided by the number of pairs required to serve those lines, allowing for a reasonable amount of spare capacity. He states that the fill factor used in "bottom up cost models" is used to divide the number of customer lines to determine the number of cable pairs required, which is then increased to the next larger available cable size, which becomes the number of pairs available. Witness Wells' definition of fill factor assumes that the network would be built with all customers in place at the same time. We do not agree with this assumption. A new efficient provider of service will be faced with the same situation with which an incumbent is faced, that is, that customers arrive on the network at different times. Therefore, we do not find appropriate the use of witness Wells' definition of fill factor for these proceedings.

Witness Wells defines utilization factor as the number of lines served, divided by the number of pairs available. This definition of utilization factor seems nearly identical to BellSouth's definition of utilization (the number of pairs in use divided by the number of available pairs). The difference is that there is not necessarily a one-to-one relationship between a pair and a line. There may be more than one line provided over a copper pair. A copper pair is a physical piece of equipment, but there is technology in use, such as the Digital Additional Main Line (DAML), described below, that provides more than one line over a copper pair. Therefore, using witness Wells' definition of utilization factor, the number of lines served is likely to be greater than the number of pairs in use, resulting in an increase to the utilization factor even though the same number of pairs are in use. It appears that with increasing use of digital technology, witness Wells' definition of utilization factor may more accurately represent the network in use. We are not persuaded, however, that any accuracy that might be gained by using witness Wells' definition of utilization factor is compensation for the problems in changing definitions at this time. Therefore, upon consideration, we find it appropriate to accept BellSouth's definition of utilization or fill factor for use in these proceedings.

AT&T/MCI witness Wood discusses utilization or fill factors at great length. He argues that a correct fill factor would include some spare capacity for administrative functions; for example, maintenance and recognition of defective pairs. He also argues that a correct fill factor would include some spare capacity for "lumpy" investments, for example, meeting a need for 550 pairs with a 600 pair cable. He does not believe that spare capacity placed for future growth should be included in a forward-looking economic cost study.

Witness Wood also argues against including future growth capacity in the calculation of the fill factor, because future customers would be paying for facilities whose costs have already been recovered since current customers would be paying for future capacity. This would constitute improper "double recovery."

BellSouth witness Caldwell disagrees that spare capacity for future growth should be excluded from the fill factor. She states that "we're looking at costs that will be used to establish rates, and, therefore, we identify all of the costs." She states that BellSouth uses "average fill" which equates to "projected actual fill of the entire usage of the network." She supports the use of

projected actual fill with reference to Order FCC 96-325, where the FCC states at ¶682 that:

> [P]er unit costs shall be derived from total costs using reasonably accurate 'fill factors' (estimates of the proportion of a facility that will be 'filled' with network usage); that is, the per-unit costs associated with a particular element must be derived by dividing the total cost associated with the element by a reasonable projection of the actual total usage of the element.

We cannot agree with AT&T/MCI's contention that all spare capacity for future growth should be excluded from the calculation of fill factors. Each customer of BellSouth, whether a retail customer or a CLEC, benefits from when sufficient capacity is in place so that service may be provided without the construction of new facilities.

The FCC's phrase, "reasonable projection of the actual total usage," is somewhat ambiguous, because it is unclear for what time period the "reasonable projection" should take place. The closer to the present the time period is for which a projection is made, the more likely it will be accurate and thus more "reasonable." We find therefore that the utilization factor in these proceedings shall be based on actual usage that has been adjusted for any projected effects or, according to BellSouth, projected actual usage.

We believe that it is important to ensure that the appropriate fill factor be used, because it bears directly and significantly on the cost of a loop. A fill factor of 40 per cent means, for example, that the cost of a one hundred pair cable is spread over 40 pairs of that cable. If the fill factor were increased to 70 per cent, then the cost of the one hundred pair cable would be spread over 70 pairs. Therefore, a lower fill factor results in a higher cost per loop, while a higher fill factor results in a lower cost per loop.

BellSouth calculated its actual fill factor distribution by dividing 5,760,416 assigned pairs by 14,856,450 available pairs, for a rate of 38.8 per cent. Witness Baeza states that BellSouth's projected fill factor is identical to its actual fill factor because BellSouth expects utilization in the future to be at or near current utilization. Witness Wells' proposed distribution

utilization factor is based on an average of initial and planned maximum utilization, or 62.5 per cent.

There are many things that can affect the fill factor, and they represent areas of substantial disagreement between BellSouth and the CLECs. We discuss them in detail below.

Defective Pairs

Witness Baeza states that defective pairs are included in the fill factor equation as available, but they cannot be used without some corrective action by BellSouth. In the fill factor equation, defective pairs are included in the denominator.

Witness Wells argues that BellSouth's defective pair rate is too high; that is, it is higher than an efficient provider would have. Witness Baeza estimates that BellSouth's distribution defective pair rate is "roughly between 9.5 and 11 per cent." He notes that the feeder defective pair rate has been increasing since 1992. In 1992, it was 9.4 per cent and in 1996, it was 10.5 per cent. Witness Wells assumes that new cables should have no defective pairs, and that the defective pair rate for newly-installed cables should be less than 1 per cent. He relies on previous, but unidentified BellSouth filings and BellSouth's cost to clear a defective pair. He argues that a low utilization rate encourages high defective pair rates because it is often expedient to simply "cut a change" and transfer the customer having trouble to a spare pair, thus leaving the initial pair defective.

We agree with AT&T/MCI that BellSouth's defective pair rates are higher than an efficient provider might encounter, and that a low utilization rate provides a disincentive to a company to clear its pairs. We understand, however, that defective pairs are a normal cost of doing business and that some portion of that cost must be shared by all customers. We find it appropriate that the distribution fill factor include the effect of a lower defective pairs rate than BellSouth's rate.

Minimum 25-Pair Cable Size

BellSouth's modeled network design includes cable sizes no smaller than 25 pairs. According to witness Baeza, BellSouth considers 25-pair cables to be the most economically efficient cable size to use in its network. He states that the savings provide BellSouth with the ability to gain economies of scale when negotiating with cable vendors. Also, he states that savings are

accrued from reduced inventory and warehousing needs, as well as reduced training and administrative costs. He testifies that BellSouth has not installed 12-pair cable since 1995, nor does it plan to install any through 1999.

Witness Wells argues that BellSouth's operating price of 25-pair minimum size cable and 25-pair distribution cable administration are major contributors to BellSouth's rather low copper distribution cable utilization factor. In addition, he disagrees that there is a cost savings from reduced training. He proposes that 12-pair cables should be deployed on the side streets, which would substantially increase utilization.

We agree that use of 12-pair cable in network design may increase the fill factor. Upon consideration, however, we find BellSouth's arguments to model a minimum of 25-pair cable reasonable because of the economies of scale. Therefore, we find appropriate in these proceedings a modeled network design based on a minimum cable size of 25 pairs.

Standard Cable Sizes

Witness Wells argues that BellSouth, through fiber cable sizing, is "over sizing" its network. Fiber, however, is not used for any of the loops under consideration in these proceedings. Therefore, we do not find witness Wells argument relevant.

Digital Additional Main Line

DAML uses electronics at the central office and the customer's premise to provision two lines over one copper pair. AT&T/MCI witness Wells states that DAML should be used to reduce spare network capacity. BellSouth witness Baeza asserts that DAML is less expensive if demand is only temporary. He further asserts that if demand is permanent and ongoing, the correct solution is to size the distribution cable to provide for the projected demand.

DAML could be used as a way to increase the fill factor, since DAML is only placed when needed. We find, however, that DAML is a temporary solution and thus should not be included in a forward-looking network design.

Bridged Tap

According to witness Baeza, bridged tap occurs when a pair of wires exists in two locations, but can only be used in one

location. According to witness Wells, there are two types of bridged tap. Pure bridged tap is bridged to the cable pair between the customer and the central office; end section tap is cable that extends past the customer.

Witness Baeza states that BellSouth's forward-looking design assumes that bridged tap is a maximum of 2,500 feet in feeder and distribution. He states that there are two reasons for the use of bridged tap. The first is so the pair can be reused by another customer. The second is that if a pair becomes defective, it is faster to restore service using a vacant pair, which may be a bridged tap pair.

Witness Wells argues that excessive bridged tap causes an unnecessary increase in BellSouth's loop investment. He proposes that BellSouth's loop model should contain no pure bridged tap and minimal end section bridged tap. Witness Wells acknowledges that his bridged tap proposal is based on the Hatfield model.

We are not persuaded by AT&T/MCI's arguments on bridged tap, because those arguments presume a hypothetical network. Therefore, we find appropriate for use in these proceedings the bridged tap assumptions in BellSouth's loop model.

Second Line Growth

Witness Baeza testifies that fill factors would not change with growth in second lines. He explains:

> [T]he way your plant is built, you build for anticipated growth. In this case, in the neighborhood, and where the first house, for example, used one line, the second house could use two, the third could use none, the fourth house could use three; so all of these things are built into attempting to have capacity there when it's required.

Transcript at 1138-1139.

Witness Wells cites a BellSouth public statement on its growth in second lines:

> BellSouth is driving revenue and profit growth by aggressively marketing additional telephone lines to our customers. Additional lines are

> key to satisfying the expanding consumer demand for connections to the Internet, Home fax machines, children's phones, telecommuting tools and home·office phones. With 1.3 million additional lines, BellSouth has the most of any telephone company in the U.S. Our additional lines increased by 21 percent in 1995, and accounted for nearly half of all new residential connections.

He argues that second line growth will increase the fill:

> BellSouth is experiencing a lot of second line growth, more than historical; and therefore it is entirely logical that the utilization rate in the future will rise because . . . all that spare capacity is already out there.

Exhibit 41 at 37-38.

We find AT&T/MCI's argument that second line growth will positively affect the fill factor to be persuasive. Therefore, upon consideration, we find it appropriate in these proceedings to include the effect of BellSouth's second line growth on its fill factors.

Effect on Competition

Witness Baeza asserts that competition would have minimal effect on the utilization rates. We find that with regard to the purchase of unbundled subloop distribution, competition alone is unlikely to affect utilization rates.

Conclusion

Based on the evidence in this record and all of the foregoing reasons, we find that BellSouth's distribution fill factor shall be increased by 10 per cent, from 38.8 per cent to 42.7 per cent.

1.5 Pair per House Default

According to witness Baeza, BellSouth's default practice is to place 1.5 pairs per housing unit. While witness Wells does not object to this practice, he expresses a concern about how it might affect the fill factor. On the basis of this record, we find no

reason to determine that BellSouth's default is not reasonable. It is conservative. We therefore leave it in place.

5-Pair Drop

Witness Baeza describes a drop as the wire connecting the loop from the pedestal to the customer's premises. BellSouth witness Caldwell states that BellSouth assumes a drop size of five pairs in its model, and is in fact deploying that size across its region. Witness Baeza asserts that a five-pair drop is an economic minimal size that allows some flexibility if a pair, or even a couple of pairs, are damaged, or if a customer requests a separate line in the house. Witness Wells argues that a CLEC should not have to support the resulting average spare capacity. Witness Baeza states that, although he did not know the exact incremental cost difference between a two-pair and a five-pair drop, it would be "pennies" per foot. Witness Wells recommends a two-pair drop for residences.

We believe that the economy in having a five-pair drop in place more than likely outweighs any incremental cost, and we find it appropriate, therefore, to accept BellSouth's proposed five-pair drop.

Drop Lengths

Witness Baeza testifies that BellSouth assumes drop lengths of 250 feet for aerial cable and 200 feet for buried cable. He explains how these assumptions were made:

> The method used to acquire this information consisted of contacting the Installation and Maintenance Managers in the state for information based on their knowledge of the areas they serve. These managers are responsible for the installation of drop wire and would have the best working knowledge of average lengths without actually measuring individual drops. The subject matter experts averaged their responses and provided a state total. Additionally, for buried service wire, the BellSouth group that administers master contracts for burying the drop was consulted and provided footage information from those contracts as a cross check.

Transcript at 617.

Witness Wells argues that the Bellcore Survey of BOC Loops reports an average drop length of 73 feet. Witness Baeza discounts the use of a national survey of drop wire because of the potential for wide variation in the inputs. We agree that the potential for wide variation in inputs makes the Bellcore survey inappropriate for use in these proceedings.

Witness Wells states that in comparison to the other RBOCs, BellSouth in Florida has approximately 237 access lines per square mile, more than twice the national average of 119 for the RBOCs. This number includes BellSouth's more densely populated metropolitan service areas, such as Miami, where drop wire is likely not to be used as extensively as it would be in more rural areas. According to witness Baeza, apartment buildings, strip shopping centers, malls and office buildings do not have drop wire.

Witness Wells proposes that aerial and buried drops be the same length, i.e., 100 feet. He explains:

> My observation from having worked in OSP [outside plant] for BellSouth in Alabama for seven years, from having field surveyed OSP in ten CBGs [census block groups] all around the state of Georgia in preparing a response to a data request from the Georgia PSC Staff, from living in BellSouth's service areas in four states for most of my life, and from traveling extensively throughout BellSouth's nine state region, is that more than 80 per cent of BellSouth's residential and small business customers have either no drop or drops that are less than 150 feet in length. I therefore recommend adjusting BellSouth's average drop length for both aerial and buried drops to 100 feet.

Transcript at 1149.

We are not persuaded by witness Wells' observations. They are not the product of a methodical study.

Witness Baeza states that he does not know if the drop wire average is weighted, nor does he know how many drop wires were

surveyed. He does, however, provide the drop wire averages in all of BellSouth's states.

Upon consideration, we do not find persuasive the AT&T/MCI arguments on drop wire length that urge the use of a national average, or the inclusion of metropolitan areas in a state-wide average of access lines per square mile, or the personal observations of witness Wells. However, we are troubled by BellSouth's lack of answers to some important questions about the drop wire survey. As discussed, AT&T/MCI proposes 100-foot drops for both aerial and buried wire. BellSouth proposes that the aerial drop wire be 250 feet and the buried drop wire be 200 feet, but does not account for the difference between its proposal and AT&T/MCI's proposal. We are not persuaded by the position of either. We do find it reasonable to approve the use in these proceedings of an average aerial drop wire of 200 feet and an average buried drop of 150 feet, because we believe that BellSouth's records of its plant inventory result in more reliable information.

Witness Wells disagrees with witness Baeza's testimony concerning the per centages of buried and aerial drop wire. He concedes, however, that he has no data that would indicate witness Baeza was incorrect. He provides only a proposal based on extensive personal observation. This is not evidence on which we can rely for the reason we stated above. Thus, we find it appropriate to accept the per centages of buried and aerial drop wire in BellSouth's inventory as proposed by BellSouth.

Deaveraged Loop Rates

AT&T/MCI witness Ellison proposes geographically deaveraged loop rates. He explains:

> State average loop prices advantage BellSouth in the competitive marketplace by providing the Company an artificial cost advantage in the more densely populated areas of the state. Averaged rates will thereby prevent the type of widespread competition envisioned by the Commission and the Act, which is antithetical to the Commission's goal of encouraging the type of widespread competition that benefits all consumers.

Transcript at 1301.

BellSouth witness Varner testifies that geographic deaveraging of unbundled loop prices cannot occur without a "dramatic rebalancing of retail prices as well." Transcript at 136. If geographic deaveraging of unbundled loop prices were to occur without retail rebalancing, he asserts that this would permit competitors to "unfairly siphon the support that allows residence [sic] rates to be as low as they are."

Again, AT&T/MCI bases its proposed geographically deaveraged loop rates in these proceedings on the Hatfield model. In Order No. PSC-96-1579-FOF-TP, at page 23, we found that the Act "can be interpreted to allow geographic deaveraging of unbundled elements, but we do not believe it can be interpreted to require geographic deaveraging." Furthermore, in Order No. PSC-97-1303-PCO-TP, at page 7, we disallowed WorldCom's proposal to include geographically deaveraged loop costs as an issue in these proceedings was denied.

Therefore, because such prices are not in issue in these proceedings, we will not address AT&T/MCI's proposed geographically deaveraged loop prices.

Material Costs

AT&T/MCI witness Wells asserts that a problem with BellSouth's model is that it has two incorrect cable costs in its cable material table. He also asserts that costs for certain building entrance and intrabuilding cables are incorrectly based on a cable code that includes the cost of strand, and that is not required in these cables. Witness Wells does not provide any evidence to support these assertions. Accordingly, we find it appropriate to accept the cable costs proposed by BellSouth.

Loading Factors

BellSouth witness Caldwell develops loadings based on accounting relationships between the investment or expenses needed to install or support material to the total installed investment. She acknowledges that these historical relationships are used to determine forward-looking costs. She explains that:

> These loadings reflect fundamental aspects of installation and supporting structures which will not be affected by technological or process innovation. For example, the cost of installing poles and conduit will be similar in the future as it is today. By applying the

> loadings, BellSouth has identified all of the capitalized cost associated with the UNE being examined.

Transcript at 333.

Witness Wells argues that BellSouth's outside plant loadings are not forward-looking and, instead, are used to recover the costs of BellSouth's past methods of operation. According to witness Wells, BellSouth develops its loading factors by calculating a ratio of certain expenses, e.g., engineering, labor, vendor engineering and installation, minor material and sales tax, to its major material investments. This ratio is then applied to the direct material costs of the hypothetical loop. He argues that this method of calculating cost is not least cost, most efficient, or forward-looking based on currently available technology. Yet, all that he offers is a statement that lacking the accounting details or expertise to challenge the specific expenses and investments underlying these material for ratios, his recommendation is that they be reduced significantly.

We do not believe the evidence shows that BellSouth is using loading factors to recover past costs of operations. We are cognizant, however, of the difficulty in defending a forward-looking cost based on data and relationships that are, by their very nature, historical. We find that using a historical relationship to determine loadings is far more likely to produce a reasonable result than any other mechanism supported by this record. Upon consideration, we find it appropriate to accept the loading relationships developed by BellSouth for use in the cost models in these proceedings.

Subscriber Line Testing

BellSouth's proposed rates include a charge for subscriber line testing that is not challenged by the CLECs. It is reasonable and thus we find it appropriate to allow this charge.

Computer Systems Cost

BellSouth's proposed TSLRIC rate includes a computer system cost, which cost is included in shared costs. This cost is not challenged by the CLECs. We consider shared costs in Part III.D above.

Conclusion

Based on the evidence in this record and on the foregoing reasons, we establish $8.57 as the recurring charge for 2-wire loop distribution. Likewise, we establish $11.29 as the recurring charge for 4-wire loop distribution.

Non-recurring Charges

Methodology

BellSouth's non-recurring rates are based on a methodology that is divided into five functions: Service Inquiry, Service Order, Engineering, Connect and Turn-Up Test, and Travel. We eliminate Service Inquiry and Service Order from consideration for the reasons set forth in Part IV below. For the same reasons, we also eliminate from consideration the Access Customer Advocacy Center (ACAC) component of Connect and Turn-Up Test.

In order to determine direct non-recurring costs for these functions, according to BellSouth witness Caldwell, BellSouth defined the work functions, established the work flows, determined the work times for each work flow, and developed directly assigned labor costs for each work function, multiplying labor rate by work times. It then added the direct costs for the work flows, added the gross receipts tax, and then applied the shared and common cost factors.

BellSouth witness Landry determined the overall work functions and work flows. BellSouth subject matter experts developed the work times. Witness Landry describes the process he used to determine the necessary work flows:

> My job was to try to develop an overall process, sort of looking at, based on my background and what I knew about the different processes, to try to start with an order flow from the front end, which groups would need to be involved, and to pull this group of network people together and to develop the methods to support the product, to develop the cost for the cost filing, and also to work with the area people in deploying those specific products so they could be provisioned locally.

Transcript at 515.

He testifies that the work times developed by the subject matter experts are reasonable:

> Based on the things that I know about the different processes, and based on the level of knowledge that the subject matter experts brought to the meeting, these are the people that have actually done that. These are the people that sat in meetings and talked to and fro about how one document or a service order comes from one person to the other, what do I have to do to be able to respond to that? How much of this falls out? What do I do with it when it falls out? I have been on the phone with a lot of the resolutions, particularly the AFIG, for the first several months of the process in trying to have some of these orders flow through, have been on the line with the network subject matter experts, with the center in the field in trying to make these orders flow and watching what had to be done to be administered. So, no, I cannot validate down to the minute each of the times that are in there, but I can attest to their reasonableness.

Transcript at 515-516.

AT&T/MCI sponsors the AT&T/MCI NRCM in these proceedings. AT&T/MCI witness Lynott describes how AT&T/MCI developed its non-recurring costs:

> The non-recurring cost model develops one-time non-recurring cost estimates for the tasks and activities that may be performed by an ILEC, such as BellSouth, when the CLEC, such as AT&T or MCI, requests wholesale services, or as the subject of these proceedings, interconnection or unbundled network elements.
>
> Utilizing a forward-looking cost methodology, the non-recurring cost model develops a bottoms-up estimate of non-recurring costs. To accomplish this, the non-recurring cost model reflects the individual tasks and

> activities that may be required to respond to a CLEC's request.

Transcript at 1249.

AT&T/MCI use inputs from the Hatfield model, as well as subject matter expert judgments, in developing its model.

AT&T/MCI witness Lynott asserts that the entire non-recurring process has changed and non-recurring costs have decreased as a result. He explains:

> Not so long ago, functions such as processing a service order were very labor intensive, requiring constant human intervention to update manual inventories and to physically complete each and every order. Today, however, the databases existing within an incumbent's OSS architecture (often referred to as 'Legacy' systems) have been automated and re-engineered to virtually eliminate the need for human intervention. . . . OSS evolution has had, and will continue to have, a very significant impact on non-recurring costs. Given that the major driver of high non-recurring costs had been incremental labor times and labor rates, the reduced reliance on human intervention due to advanced OSSs has significantly reduced the incremental non-recurring cost associated with functions such as pre-ordering, ordering, provisioning and maintenance. Significant cost savings can be achieved with existing OSS, if their capabilities are not undermined by polluted databases or inefficient configurations.

Transcript at 1211-1212.

BellSouth witness Caldwell testifies that the structure and approach of the AT&T/MCI model appear to be reasonable. She takes exception, however, to AT&T/MCI's assumption of a non-recurring process that occurs with almost no human intervention, calling it unrealistic. She states that non-recurring costs, which are forward-looking, must be based on technologies that exist today and that BellSouth expects to deploy, not on some hypothetical technology. She continues:

> Work order activities such as engineering requests for manual assistance and connect and test are required in order for BellSouth to provide a reliable product, on time, that meets the customer's needs regardless of whether the customer is an individual or a CLEC or whether the order was received manually or electronically.

Transcript at 356.

Witness Caldwell states that in BellSouth's view of non-recurring costs, there are provisioning activities that require technicians to perform physical tasks. MCI argues, however, that AT&T/MCI's non-recurring cost model assumes that pre-ordering, ordering, provisioning, repairs, maintenance, and billing processes are handled electronically through OSS in a highly automated, accurate and rapid manner with little to no human intervention.

Each of the parties develops non-recurring costs by means of a methodology for determining the necessary work functions and associated work times to provision loops. We find that methodology generally to be appropriate for use in these proceedings.

Migration

An integral assumption in AT&T/MCI's NRCM is migration. AT&T/MCI witness Lynott defines migration as occurring when a customer with existing service requests changes in its local service provider. Witness Lynott asserts that this contrasts with an installation, which is defined as the establishment of any new (or additional) service for a CLEC customer. He states that the model assumes that the only cost for a migration order is processing time because the model further assumes that the activities used to migrate a customer from an ILEC to a CLEC can be accomplished electronically through the electronic gateway that exists between a CLEC and BellSouth and BellSouth's OSSs that the CLEC is accessing.

Witness Caldwell disagrees with AT&T/MCI's assumptions concerning migration:

> Let me emphasize the migration of a customer from BellSouth to a new entrant is not just a record change. In an unbundled environment, the loop must be physically removed from our

> switch and then re-terminated on the CLEC's switch or recombined in the CLEC's space. This does not happen by magic, nor do improved OSS capabilities allow this to happen automatically.

Transcript at 358.

For the loops at issue in these proceedings, 2 and 4-wire loop distribution, 2-wire ADSL compatible loops, and 2 and 4-wire HDSL compatible loops, we can agree with BellSouth that there are tasks to be performed that are different from a simple customer change from BellSouth to a CLEC. With loop distribution, a connection must be made at the serving area interface to the CLEC's equipment. This requires a physical action at a location in the field. According to witness Caldwell, Digital Subscriber Line (xDSL) (Asymmetrical Digital Subscriber Line (ADSL) and High-bit Rate Digital Subscriber Line (HDSL)) loops, however, run from the NID to BellSouth's central office where they then must be connected to a CLEC's equipment. The xDSL loops must also meet certain design standards. We are persuaded by BellSouth's argument that simple migration of a customer is not possible with the loops and loop distribution elements at issue in these proceedings.

Fallout

BellSouth witness Landry testifies that when BellSouth talks about fallout, it refers to errors on an initial service request from a CLEC that require that the service request be processed manually. In contrast, AT&T/MCI witness Lynott testifies that when AT&T/MCI talks about fallout, it refers to what happens when a service request does not flow through an OSS automatically. Any fallout during the pre-ordering and ordering processes is the responsibility of the ILEC, according to witness Lynott. As already mentioned, however, we do not consider fallout in the pre-ordering or ordering process in these proceedings.

According to witness Lynott, AT&T/MCI's "conservative" fallout assumption of 2 per cent is based on the judgment of our experts of a competitive industry, as well as fallout levels reported by ILECs, such as Southwestern Bell and US West. The fallout levels reported by US West refer to preferred interexchange carrier (PIC) changes. PIC changes occur when an ILEC customer changes long distance carriers. According to BellSouth witness Landry, PIC changes are a simple electronic translation change and are not

reflective of the complexity of separating a loop facility from the switch and providing it as an unbundled element.

We can agree with BellSouth that PIC changes and the provisioning of UNEs are not similar functions. We are not persuaded by mention of low fallout rates for other ILECs. We believe that fallout responsibility is shared, starting with the service request submitted by a CLEC and continuing through the ILEC's provisioning process. Therefore, we find consideration of fallout appropriate in establishing work times for the provisioning process.

Use of Forward-Looking Technologies

MCI argues that BellSouth's non-recurring costs do not assume forward-looking technologies, specifically citing the absence of integrated DLC. MCI asserts that:

> [I]f BellSouth were to assume forward-looking technologies, such as integrated DLC with a GR-303 interface in its cost studies, the software based stored program technology would allow for flow-through provision and maintenance from upstream OSS systems right down to the network elements in a matter of seconds with little or no human intervention.

MCI Brief at 23.

Loop distribution, by definition, is provisioned over copper. WorldCom witness Porter agrees that ADSL loops cannot be served over integrated DLC. Although witness Porter does not specifically refer to HDSL loops, it is reasonable to conclude that the same is true for HDSL loops. Accordingly, we give no weight to MCI's assertion.

Direct Labor Rates

As we discuss in Section III.D of this Order, we approve BellSouth's direct labor rates for use in calculating direct costs.

Work Times

As we earlier observe, the assumptions of BellSouth and AT&T/MCI concerning work functions and work times represent the spectrum boundaries for task work times involved in provisioning

the loops here in question. We characterize AT&T/MCI's view as representing the "best case" scenario, the most automated, least cost provisioning. We do not believe that AT&T/MCI's view, which is optimistic, captures all of the manual intervention that is actually required to provision UNES. For example, according to witness Lynott, AT&T/MCI assumes that the time required to make a cross connect at the crossbox, test the circuit with the central office at the premise and FDI, tag the circuit, and complete the order only takes just over 30 minutes for 2-wire loop distribution and only about 25 minutes for 4-wire HDSL compatible loops.

By the same token, BellSouth's view represents a "worst case" scenario. For example, witness Landry testifies that the time required for that same process takes about one hour and 35 minutes for 2-wire loop distribution and about 2 hours and 40 minutes for 4-wire HDSL compatible loops. In other examples, witness Landry testifies that BellSouth assumes 100 per cent dispatch to connect for all loops and that all xDSL loops are new.

We again find it appropriate to apply our judgment to reasonably resolve the disparities in the parties' positions. Thus, we shall reduce BellSouth's work time proposals by 25 per cent of the difference between them and AT&T/MCI's proposals. BellSouth has its technicians in the field every day actually installing, repairing and maintaining service, and presumably has, for that reason, the better information with respect to the associated work times. We find, however, that BellSouth's proposed incidental travel time is acceptable without adjustment.

Tables VIII and IX show the work times we approve, based on the foregoing discussion, for the installation of 2-wire and 4-wire loop distribution.

TABLE VIII
2-Wire Loop Distribution Installation Work Times

Function	Activity	Commission Approved Work Times (Hour)
Engineering	AFIG assigns cable pairs according to FRN and rules	.1510 .1510
Engineering	CPG design	not applicable not applicable
Connect & Turn-Up Test	I&M makes cross-connect @ box, tests circuit with CO @ premise & cross box, tags circuit & completes order	1.3418 1.2168
Travel	I&M incidental time not captured in NID/drop investment	.3333 .0000
Totals		1.8261 1.3678

Upper value shown is for the first installation; lower value, each additional installation.

TABLE IX
4-Wire Loop Distribution Installation Work Times

Function	Activity	Commission Approved Work Times (Hour)
Engineering	AFIG assigns cable pairs according to FRN and rules	.1510 .1510
Engineering	CPG design	not applicable not applicable
Connect & Turn-Up Test	I&M makes cross-connect @ box, tests circuit with CO @ premise & cross box, tags circuit & completes order	2.1177 1.9927
Travel	I&M incidental time not captured in NID/drop investment	.3333 .0000
Totals		2.6020 2.1437

Upper value shown is for the first installation; lower value, each additional installation.

Conclusion

Upon consideration, we approve non-recurring charges for 2-wire loop distribution installation of $78.29 for the first installation and $58.33 for each additional installation. Further, we approve non-recurring charges for 4-wire loop distribution installation of $112.07 for the first installation and $92.11 for each additional installation.

C. 2-wire ADSL-Compatible Loops

Our discussion above of 2-wire and 4-wire loop distribution is generally applicable to 2-wire ADSL loop installation. Here, we discuss in detail only those issues that are specific to 2-wire ADSL loop installation.

Element Definition

BellSouth provides a definition for ADSL-compatible loops, as follows:

> The 2-wire ADSL-Compatible Loop ... [is a] physical transmission facilit[y] (or channel or group of channels on such facilit[y]) which extend[s] from the main distributing frame connection in the end office to a demarcation point at the customer premises (i.e., the network interface device or NID). The transmission facility does not enter the BellSouth switch as it is terminated on the main distributing frame. ADSL-compatible ... loops are non-loaded 26 gauge copper facilities with specific length limitations.

Exhibit 13 Part 2 at 2.

Recurring Charges

Utilization/Fill Factor-Feeder

ADSL-compatible loops must be provisioned over copper. BellSouth calculates its actual fill factor for these loops by dividing 4,169,515 assigned pairs by 6,349,457 available pairs, for a rate of 65.7 per cent. BellSouth witness Baeza states that BellSouth's projected fill factor is identical to its actual fill factor because it expects utilization in the future to be at or near current utilization.

In support of BellSouth's fill factor, witness Baeza provides an exhibit that compares BellSouth's feeder fill to that of the other RBOCs. Pacific Telesis' fill factor is highest at 92.16 per cent. BellSouth's is next highest and Bell Atlantic's was the lowest at 41.54 per cent.

AT&T/MCI witness Wells argues that the 65.7 per cent fill factor is understated because it includes the effect of a high defective pair rate. We took note earlier that BellSouth's feeder defective pair rate increased from 9.4 per cent in 1992 to 10.5 per cent in 1996, and we agreed with AT&T/MCI that BellSouth's defective pairs rate is higher than an efficient provider would encounter. We conclude, nevertheless, that defective pairs are a normal cost of doing business, and that some portion of that cost should be shared by customers.

Witness Wells is critical of BellSouth's practice of measuring feeder fill at the Main Distribution Frame (MDF). He argues that measurement at the MDF understates fill because some engineers automatically oversize the feeder cable that enters the central office. He asserts that fill should be measured at various cable segments, with weighted averages of those segments equivalent to fill. Although measuring feeder fill at the MDF may result in somewhat of an understatement, we believe it would not be cost-effective to measure fill factor for each feeder cable at several points along the cable. Therefore, we find that an adjustment of the feeder fill factor measurement at the MDF is unnecessary.

Witness Wells asserts that BellSouth includes over-sizing of feeder cable based on optimistic forecasts of growth. This occurs, he says, primarily in low growth central offices. We conclude, however, that with an actual fill of 65.7 per cent, based on a defective pair rate of 10.5 per cent, the cable over-sizing claimed by witness Wells is not significant, because BellSouth's fill factor is relatively high.

For 2-wire ADSL-compatible loops, we find it appropriate to increase BellSouth's proposed fill factor by 5 per cent to 69.0 per cent from 65.7 per cent to reflect a lower defective pair rate and increased second line growth.

Use of Single Feeder Distribution Interface

Witness Wells proposes that there should be only one FDI or crossbox per loop in a forward-looking loop design, although BellSouth has incorporated sample loops with multiple cross-connects into a single hypothetical loop. He does not, however, offer a way to calculate the effect that including multiple crossboxes might have on the cost of a loop.

We have approved BellSouth's recasting of its loops in these proceedings. AT&T/MCI does not justify its assertion concerning multiple crossboxes or an estimate of their impact. We do not, therefore, find it appropriate to modify loop design in these proceedings to exclude multiple crossboxes.

Main Distribution Frame Cost

BellSouth develops the MDF cost for 2-wire ADSL-compatible loops using Bellcore's Switching Cost Information System (SCIS) model. Neither AT&T/MCI nor WorldCom address this cost. We find the cost BellSouth proposes reasonable and thus we approve it.

Conclusion

Based on the evidence in this record and on the foregoing discussion, we establish $15.81 as the recurring charge for 2-wire ADSL-compatible loops.

Non-recurring Charges

We discuss BellSouth's and AT&T/MCI's proposals for NRCs above. Here, we discuss only WorldCom's proposal for NRCs for xDSL-compatible loops.

WorldCom witness Porter explains how WorldCom calculates its proposed non-recurring charges:

> Approximately 26 minutes of labor are associated with the average digital loop conversion for the first line, and 14.5 minutes for each additional line. BellSouth's labor rate is proprietary. For the sake of argument, however, if the loaded labor rate is somewhere between $30-$60 per hour, or $45 on average, then the non-recurring charge for the first order should be approximately $19.50, and for additional orders approximately $10.87.

Transcript at 948.

He testifies that there would, however, be almost no non-recurring cost because BellSouth would simply reassign a loop serving one of its former customers to WorldCom.

Witness Porter divides non-recurring functions into four groups: Service Order; Engineering; Connection and Testing; and Field. We do not address the Service Order function for reasons already stated. For Engineering, he agrees that xDSL loops may require conditioning so that they will meet standards. He estimates that 10 per cent of orders will require upgrades and that these upgrades will be done in groups of 25. He proposes a time of five minutes to upgrade these loops. He also estimates that 10 per cent of orders will require an additional 30 minutes of engineering, or an average of three minutes per order. He does not, however, provide field data in support of his estimates of the percent of xDSL loops that require conditioning and additional engineering.

For Connection and Testing, witness Porter estimates an average of five minutes for installation and maintenance, and three minutes for special services coordination and testing. For Field, he estimates that travel time is possible for 10 per cent of the orders. He assumes 15 minutes of travel time to a cross connect and 15 minutes of time to make the cross connect, that is, 30 minutes for 10 per cent of the orders, or an average of three minutes per order.

Witness Porter supports WorldCom's proposed NRCs with reference to BellSouth's tariffed NRCs:

> BellSouth charges residence customers $40 for the first line and $12 for each additional line. BellSouth charges business customers $56 for the first line and $12 for each additional line. For the sake of argument, if WorldCom's business customers desired high speed digital loops, WorldCom would pay nearly 10 times the non-recurring charges to connect the loop than BellSouth's own retail customers would if we adopted the Loop Study costs.
>
> * * *
>
> [T]he non-recurring connection charge for basic exchange service can serve as an appropriate benchmark for Commission consideration because little installation is involved in making BellSouth loops ADSL and HDSL compatible, nor is much BellSouth engineering, testing, or travel required to

> convert a BellSouth customer to high speed digital service provided by WorldCom over BellSouth unbundled loops. In most cases, BellSouth's loops should be of sufficient quality that WorldCom can use them for high speed digital transmission without further conditioning.

Transcript at 942.

BellSouth witness Landry dismisses the apparent disparity between BellSouth's tariffed NRCs and those it proposes in this proceeding, arguing that the services are two entirely different things. We agree that the services are different and that different work functions might be necessary. We do not find that there is sufficient evidence in this record to support WorldCom's claim that tariffed rates can be used to support WorldCom's rate proposal.

Witness Porter also asserts that WorldCom's proposed NRCs are reasonable because in BellSouth's ADSL trial in Birmingham, Alabama, BellSouth does not assess non-recurring charges. He explains:

> I doubt that BellSouth would charge its customers $20 per month in its initial ADSL trial and then charge new customers a $600 set-up fee to initiate service. As I have opined, the recurring charge is more on the order of $19.50. I doubt that BellSouth is absorbing $600 per customer in its ADSL trial. This would be an extraordinary promotional offer even for BellSouth. Rather, I believe they are only absorbing $19.50 per customer.

Transcript at 964.

We only conclude from this that actual costs may very well exceed trial charges.

Testing

Witness Porter objects to BellSouth's inclusion of testing as part of the non-recurring functions. He testifies that, while BellSouth intends to provide testing for almost every loop that it provisions, for many loops WorldCom will perform the testing itself

without the assistance of BellSouth. He asserts that BellSouth discriminates against loop purchasers in this way.

Witness Landry argues, however, that the xDSL loops have specific, specialized test requirements so that BellSouth can turn over the service to the CLEC with assurance that the service will function as ordered.

We conclude that in providing good customer service, an ILEC must test the loops it is selling to a CLEC before they are provided to the CLEC. If a CLEC is paying for a loop, it should receive a loop that does not need repair or further work. We believe that any customer would be dissatisfied if loops it purchases do not work, even if the customer has agreed to do the testing. Therefore, we find BellSouth's proposed testing costs reasonable and appropriate in these proceedings.

Work Time Comparisons

Table X shows the work times we approve, based on the foregoing discussion, for the installation of 2-wire ADSL-compatible loops.

TABLE X
2-Wire ADSL-Compatible Loop Installation Work times

Function	Activity	Commission Approved Work Times (Hour)
Engineering	AFIG assigns facilities	 .0125 .0125

Function	Activity	Commission Approved Work Times (Hour)
Engineering	CPG processes service request & generates DLR & word document to ALEC and field	.1002 .1000
Engineering		.0000 .0000
Connect & Turn-Up Test	CO I&M field work group connects facility at collocation point	.0437 .0437
Connect & Turn-Up Test	SSIM makes cross-connect @ cross-box, tests circuit with CO @ premise & cross box, tags circuit & completes order	2.0460 2.0356
Connection & Testing		.0000 .0000

Function	Activity	Commission Approved Work Times (Hour)
Travel	I&M incidental time not captured in NID/drop investment	.3000 .0000
Field		.0000 .0000
Totals		2.5025 2.1918

Upper value shown is for the first installation; lower value, each additional installation.

Conclusion

Upon consideration, we approve non-recurring charges for 2-wire ADSL-compatible loops of $113.85 for the first installation and $99.61 for each additional installation.

D. 2-wire and 4-wire HDSL-Compatible Loops

Our discussion above of 2-wire and 4-wire loop distribution and 2-wire ADSL-compatible loops is also applicable to 2-wire and 4-wire HDSL loops.

Element Definition

BellSouth provides the following definition for 2-wire and 4-wire HDSL-compatible loops:

> The 2-wire HDSL [High Bit Rate Digital Subscriber Line] Compatible Loop, and 4-Wire HDSL Compatible Loop are physical transmission facilities (or channel or group of channels on such facilities) which extend from the main

> distributing frame connection in the end office to a demarcation point at the customer premises (i.e., the network interface device or NID). The transmission facility does not enter the BellSouth switch as it is terminated on the main distributing frame. HDSL compatible loops are non-loaded 26 gauge copper facilities with specific length limitations.

Exhibit 13 Part 2 at 2.

Recurring Rates

Conclusion

Based on the evidence in this record and on the foregoing discussion, we establish $12.12 as the recurring charge for 2-wire HDSL-compatible loops and $18.24 as the recurring charge for 4-wire HDSL-compatible loops.

Non-recurring Rates

The parties propose the same function work times for 2-wire HDSL-compatible loops as they do for 2-wire-ADSL compatible loops, and upon the same considerations, we approve the same function work times for 2-wire HDSL-compatible loops as we do for 2-wire ADSL compatible loops. These work times are shown in Table X.

Table XI shows the work times we approve, based on the foregoing discussion, for the installation of 4-wire HDSL-compatible loops.

TABLE XI
4-Wire HDSL-Compatible Loop Installation Work Times

Function	Activity	Commission Approved Work Times (Hour)
Engineering	AFIG assigns facilities	.0125 .0125
Engineering	CPG processes service request & generates DLR & word document to ALEC and field	.1002 .1000
Engineering		.0000 .0000
Connect & Turn-Up Test	CO I&M field work group connects facility at collocation point	.0437 .0437

Function	Activity	Commission Approved Work Times (Hour)
Connect & Turn-Up Test	SSIM makes cross-connect @ cross-box, tests circuit with CO @ premise & cross box, tags circuit & completes order	2.1127 2.0814
Connection & Testing		.0000 .0000
Travel	I&M incidental time not captured in NID/drop investment	.3000 0
Field		0 0
Totals		2.5691 2.2770

Upper value shown is for the first installation; lower value, each additional installation.

Conclusion

Upon consideration, we approve non-recurring charges for 2-wire HDSL-compatible loops of $113.85 for the first installation and $99.61 for each additional installation. Further, we approve

non-recurring charges for 4-wire HDSL-compatible loops of $116.91 for the first installation and $101.71 for each additional installation.

E. Physical Collocation

Element Description

Physical collocation is an arrangement that allows a CLEC to locate its own telecommunications equipment in a segregated space within the ILEC's central office (CO). AT&T/MCI witness Bissell and BellSouth witness Varner both explain that the CLEC pays the ILEC for use of that space. The CLEC is then allowed to enter the CO to install, repair, and maintain its collocated equipment. According to BellSouth witness Caldwell, physical collocation involves the installation of collocator-owned equipment within leased floor space in BellSouth central offices and the CLEC purchase of cross connects to access BellSouth's network. The Point of Termination (POT) Bay is the official demarcation point. AT&T/MCI witness Bissell describes physical collocation similarly and further notes that it also requires fiber connections between the manhole outside the CO and the CLEC equipment inside. According to witness Bissell, collocation is a low technology aspect of a high technology industry in that it simply requires setting up metal cages to hold the CLEC equipment, installing the cable on the racks, and grounding the equipment.

Specifically, physical collocation involves the following elements, which AT&T/MCI and BellSouth identify and address: Planning and Engineering; Preparation of the general collocation area; Cage Construction; Land and Building or Floor Space; Entrance Fiber; Power (Delivery and Consumption); POT Bays; Connectivity (Voice Grade, DS-1, DS-3, Optical); and Security Access.

In making our determinations on the issue of physical collocation rates, we apply the pertinent sections of the Act. Sections 251(c)(2) and (3) of the Act require that incumbent LECs provide interconnection and access to UNEs at any technically feasible point at a level of quality equal to that which it provides itself, at rates, terms, and conditions that are just, reasonable, and non-discriminatory.

Regarding physical collocation, Section 251(c)(6) of the Act states that incumbent LECs have:

> The duty to provide, on rates, terms, and conditions that are just, reasonable, and nondiscriminatory, for physical collocation of equipment necessary for interconnection or access to unbundled network elements at the premises of the local exchange carrier, except that the carrier may provide for virtual collocation if the local exchange carrier demonstrates to the State commission that physical collocation is not practical for technical reasons or because of space limitations.

Section 252(d)(1) of the Act requires that we determine just and reasonable rates for interconnection and access to UNEs that are non-discriminatory and based on costs determined without reference to a rate of return or other rate-based proceeding. In addition, rates may include a reasonable profit.

BellSouth witness Varner states that the pricing standards specified in Section 252(d)(1) of the Act relate only to Sections 251(c)(2) and 251(c)(3) of the Act regarding interconnection and access to UNEs. He argues, therefore, that no standard is specified for the pricing of collocation. Witness Varner, however, also testified that collocation has been defined as a UNE, that it is really "access" to UNEs, and that the FCC rules have defined access to a UNE as a UNE itself.

From the testimony and evidence presented, it is apparent to us that collocation is a primary means of interconnection and access to UNEs. We believe, therefore, that collocation is subject to Section 252(d)(1) requirements. Thus, we apply the same requirements to the pricing of collocation apply as for other UNEs.

Methodologies

The parties in these proceedings advocate the use of differing methodologies in determining the rates for collocation. To a large extent, the parties agree on what elements are needed for physical collocation, such as enclosures, cables, and cross connects. There is, however, significant disagreement as to how the costs for the various elements should be computed and recovered. We include a summary of each approach.

BellSouth's Collocation Cost Methodology

In support of its Physical Collocation proposals, BellSouth uses its TELRIC Calculator and its Physical Collocation Cost Estimating Spreadsheet. BellSouth witnesses Caldwell and Zarakas sponsor the TELRIC Calculator, which was used to develop TSLRIC and TELRIC estimates for the UNEs at issue in these proceedings. Although BellSouth develops specific models to determine the costs of some of the UNEs, such as the loop, switching and transport, witness Zarakas indicates that BellSouth uses a simple spreadsheet approach for physical and virtual collocation.

BellSouth witness Redmond, the only BellSouth collocation-specific witness, does not specifically address costs beyond vendor prices, and sponsors testimony only on BellSouth methods and procedures for the actual construction of the physical collocation space itself. No BellSouth witness addresses the costs of cabling or cross connects associated with physical collocation in detail.

Collocation costs are divided into recurring and non-recurring components in the BellSouth TELRIC Calculator. BellSouth witness Caldwell states that recurring costs reflect the capital costs and operating expenses associated with the investments required to provide an item of plant. Witness Caldwell asserts that capital costs include depreciation, cost of money and income taxes, while operating expenses include plant specific expenses, ad valorem taxes, and gross receipts taxes. Non-recurring costs include one-time expenses associated with provisioning, installing, and disconnecting the unbundled network element. She also asserts that the major non-recurring cost categories include service order processing, engineering, connect and test, and technician travel time. Witness Caldwell does not, however, address specific recurring and non-recurring costs associated with collocation except for the Application Fee and the Space Preparation charge, which were addressed in her rebuttal testimony.

BellSouth proposes an NRC for the Application Fee and cable installation. BellSouth suggests recurring charges for space construction, floor space, cable support structures, power, and POT bays, while it proposed both recurring and non-recurring charges for cross connects. BellSouth also proposes that charges for security escorts be assessed per occasion by the half hour. Finally, BellSouth proposes that space preparation costs be recovered via a non-recurring charge assessed on an Individual Case Basis (ICB).

BellSouth also provides a draft of its Property Management Physical Collocation Guidelines (Guidelines) that are in the process of being developed by BellSouth witness Redmond. These Guidelines address BellSouth's Property Management Department's activities in the collocation application process. We note that Property Management is one of several BellSouth departments involved in implementing collocation requests. Specifically, Property Management handles building modifications and contractor management. BellSouth demonstrates that other functions and departments involved in collocation include the BellSouth Collocation Center, which provides the Account Team Collocation Coordinator, the Interexchange Network Access Coordinator (INAC), Outside Plant Engineering (OSPE), Circuit Capacity Management (CCM), Common Systems Capacity Management (CSCM), and Central Office Operations.

According to BellSouth's Guidelines, the common physical collocation space in a CO should be laid out for the first request. The area should be selected in such a way that direct access can be provided without the collocator entering BellSouth space, even if extra construction is required to achieve this. The entire collocation space should be separated from BellSouth equipment by a barrier wall. The space should be designed to accommodate all prospective collocators, reserving, if possible, 3,000-5,000 square feet. According to the Guidelines, it is important to try to create a large common collocation space whenever possible rather than using existing small rooms, because even if the short term costs are greater, greater long term advantages are achieved.

BellSouth's approach also includes offering collocators the option of placing their equipment in either open lineups or within walls constructed within the dedicated collocation area. The BellSouth design includes aisles to provide access to the equipment, and the Guidelines recommend that consideration be given for the possibility of "checker boarding," which means that space is left between the facilities of individual collocators to allow for growth. The Guidelines state that "checker boarding" is not required, however, and collocators are not guaranteed contiguous space within a CO. According to the Guidelines, each request for additional space requires a new application.

BellSouth witness Caldwell states that the costs we set for collocation should reflect forward-looking network architecture, engineering and materials, and equipment. BellSouth witness Varner argues against the adoption of AT&T/MCI's concept of a "hypothetical central office building." BellSouth witness Redmond

also asserts that collocation, by definition, involves the rearrangement of existing central office facilities, not new buildings and, therefore, the Collocation Cost Model submitted by AT&T/MCI is inappropriate for estimating collocation costs.

AT&T/MCI's Collocation Cost Methodology

AT&T/MCI sponsored the Collocation Cost Model to determine the appropriate costs of collocation in Florida. According to witness Klick, MCI and AT&T retained technical subject matter experts to help develop efficient, forward-looking costs for physical and virtual collocation. Based upon a central office model layout and a collocation area model layout, the subject matter experts identified the investments that an efficient ILEC would need to make to provide collocation space to potential CLEC collocators, including the EF&I costs. Witness Klick asserts that the investments were used as inputs into the Collocation Model to estimate recurring and non-recurring costs.

AT&T/MCI's Model treats investments that are incurred for the benefit of a single collocator and that cannot be used by subsequent occupants of the collocation space as a non-recurring cost. Investments that are shared by more than one CLEC or can be used by subsequent occupants of the same collocation space are treated as recurring costs that would be paid for on a monthly basis by the collocators. In converting the monthly investments to monthly costs, however, the Model incorporates a cost of capital that compensates the ILEC for both the time value of money and the business risk it incurs. In addition, witness Klick asserts that the Model includes a user-adjustable "occupancy adjustment factor" to explicitly recognize that each physical collocation space provided in the collocation area model layout may not be fully occupied over its economic life. Witness Klick further asserts that calculations for both monthly capital costs and the monthly operating expenses that would be incurred by the ILEC in efficiently providing collocation space on a recurring basis are developed using standard financial techniques. He adds that items such as taxes, general support investment, and common costs are reflected in the cost outputs of the Model.

The forward-looking CO model layout assumes a new urban CO designed for up to 150,000 lines, together with associated transport, power, multi-media, and miscellaneous equipment space. Such an office would need approximately 36,000 square feet of equipment space, or three equipment floors of about 12,000 square feet, plus a below-ground cable vault. The CO model layout also

assumes an additional 3,000 square feet on each floor and an entire basement, except for the cable vault area, to provide a generous allowance for building support services such as main corridors, elevators, washrooms, lunch rooms, conference facilities, administrative areas, electrical rooms, and mechanical rooms. AT&T/MCI witness Bissell asserts that this results in an overall footprint of 15,000 square feet.

The Model area layout assumes a best-price planning strategy that permits more than one collocation area to be assigned in a CO based on available space in close proximity to ILEC cross-connects. Each collocation area is 550 square feet in order to take advantage of smaller areas that would be in relatively close proximity to ILEC cross-connects. Witness Bissell indicates that this assumption reflects an expectation by the model layout developers that, in terms of placement, the ILEC would employ the same best planning process that it would use when planning efficient equipment space allocations for its own equipment. Within the 550 square feet collocation area, the collocation area model layout assumes the construction of four 100 square feet equipment areas and a common space of 150 square feet. Witness Bissell asserts that the Model anticipates that the cost of the entire common area would be shared by all CLECs, with no contribution from the ILEC, and that CLECs would request collocation space in increments of 100 square feet.

WorldCom's Collocation Cost Methodology

WorldCom does not sponsor any cost support of its own in these proceedings. WorldCom proposes that we permanently adopt the interim rates and elements contained in the BellSouth/MFS agreement. WorldCom argues that if we do not approve its interim collocation rates as permanent, then we should adopt the rates AT&T/MCI proposes.

Elements of Collocation

Application Fee/Cage Construction-Planning

BellSouth proposes a substantial one-time application fee of $7,186 to recover 87.5 hours of labor involving seven different BellSouth departments. BellSouth proposes to assess this fee at the initiation of each application process each time a CLEC requests new or additional space in a CO. Witness Caldwell asserts that BellSouth's proposed application fee would recover the costs

of developing a firm estimate of the cost to build, provide, or add collocation space requested by a CLEC.

Witness Caldwell explains that the potential collocator first submits its initial application to the BellSouth Collocation Center. The Account Team Collocation Coordinator in that department acts as the customer interface and forwards the application to the INAC in the specific state who will be the area contact. The INAC distributes the application to the designated personnel in each BellSouth department involved in the process. These departments are Outside Plant Engineering, which handles cable entrance assessment; Circuit Capacity Management, which determines facility and equipment capacity and growth needs; Common Systems Capacity Management, which determines space planning equipment compatibility and handles cable support; Central Office Operations, which reviews facility, equipment, and space operations; and Property Management, which handles building modifications and contractor management.

BellSouth demonstrates that Property Management receives the initial application from the INAC, logs it in and faxes it to its Facility Planner and Strategic Planner. The Facility Planner contacts the personnel in Network Operations and Capacity Management to review the central office for available space. According to BellSouth's Physical Collocation Guidelines, the Facility Planner is responsible for a high-level cost estimate responsive to the initial CLEC inquiries for collocation space. At that point in the inquiry process, a detailed design will not have been done; thus, the estimate would be made using the planner's "best guess" as to what the design will be. Property Management must respond to the INAC within 10 days, and the INAC must respond to the applicant within 15 days.

If the applicant then places a firm order, the routing process is essentially repeated. This time the Facility Planner contacts the various departments to prepare a space layout. A coordination meeting between the applicant and BellSouth personnel is scheduled to negotiate layout, intervals, and other requirements. BellSouth personnel are responsible for hiring any architects, engineers, consultants and contractors needed.

BellSouth's proposed application fee appears to cover only the man-hours associated with the initial application process leading up to the placement of a firm order. BellSouth witness Caldwell states in her testimony that the Application Fee covers the cost of a service inquiry function, which is performed to determine if a

CLEC's request for physical collocation can be met. She analyzes the manpower requirements as follows:

INAC	40.0 hours
Marketing (Collocation Center)	27.5 hours
Property Management	3.5 hours
Outside Plant Engineering	0.5 hours
Common Systems Capacity Management	8.0 hours
Circuit Capacity Management	8.0 hours
	87.5 hours

After review of the breakdown provided for these manpower estimates, it appears that nine hours are spent reviewing the initial application and collocation agreement internally, as well as with the applicant, processing the application fee, and performing other initial administrative functions, such as identifying coordinators and updating data bases. Common Systems Management, Circuit Capacity Management, and Outside Plant engineering spend 16.5 hours determining high-level estimates of requirements and costs associated with their departments, and Property Management spens 3.5 hours developing a preliminary plan and high-level cost estimate. The INAC spends 40 hours conducting coordination activities, and providing the data and responses to the Account Team coordinator. Finally, Marketing spends another 18.5 hours coordinating, preparing and distributing the written response to the customer with the cost estimate.

Under BellSouth's plan, if the CLEC agrees and places a firm order, only then does design and construction of the collocation area and cage begin. BellSouth includes separate labor charges for design and engineering in its space construction and cable installation fees.

AT&T/MCI's model takes a different approach to the initial application and planning activities. It assumes that more total man-hours are spent developing the firm estimate of the costs of the project. It includes a different cost recovery approach. Specifically, it includes 52 hours of planning and design engineering specific to the individual collocator. In addition, it includes 66 hours of labor for planning and engineering that would apply not just to the first collocation request, but also to facilitate processing of subsequent requests in that same CO. Thus AT&T/MCI proposes a total of 118 manpower hours for initial planning. There are, however, several important distinctions.

The first distinction is that AT&T/MCI proposes that only the initial 52 hours be billed to the CLEC as an NRC in the amount of $3,325.43. According to AT&T/MCI witness Bissell, BellSouth incorporates the costs that AT&T/MCI identifies as specific to an individual CLEC, the non-recurring portion of its planning fee in Space Preparation (below) to be assessed as an ICB. As part of its proposed planning costs, AT&T/MCI includes a much smaller application fee to cover administrative costs such as those associated with setting up billing accounts.

Second, the next 66 hours of planning and design would be recovered through a recurring monthly charge to reflect the fact that subsequent collocators will also benefit from the initial planning activities. We note that AT&T/MCI includes more actual design and engineering in their proposed manpower requirements.

Unlike BellSouth, AT&T/MCI does not propose an initial Application Fee to recover all these costs up front. Instead, AT&T/MCI proposes a three-element Cage Construction charge, one portion of which is identified as "Planning." "Planning" consists of both the non-recurring and recurring charges we have described.

Specifically, AT&T/MCI witness Bissell expresses concern that BellSouth's proposed Application Fee does not address the reduced manpower required for subsequent collocation requests in the same CO. He notes that with physical collocation the manpower required for a second request would be much lower since the overall planning activities are completed with the first request. As an example, he states that when the first collocator is established, then the overall collocation area is in place, cable routes providing connectivity are installed, the entrance fiber route is established, and ILEC processes are in place. He proposes that, at a minimum, BellSouth should establish a separate, reduced application charge for subsequent collocation requests within the same CO. He states that, based on his experience, the subsequent charge should be reduced by 30 per cent.

WorldCom's witness Porter notes the difference between the $3,850 application fee in WorldCom's interim agreement and the substantially higher application fee that BellSouth now proposes. He states that most of the difference can be attributed to "business marketing," which he says is not necessary for WorldCom to collocate in BellSouth's central offices. He concludes, therefore, that this marketing charge is unnecessary and excessive. BellSouth witness Caldwell explains that "marketing" expenses are those expenses associated with customer contact and administrative

functions in connection with processing collocation requests, including meetings, clarifying terms and conditions, processing the application, preparing and distributing the response, and billing. WorldCom witness Porter does not dispute her explanation. He provides no further testimony or opinion on this element.

Conclusion

Upon consideration of the evidence and arguments presented, we find that BellSouth's manpower estimates for its initial Application Fee are excessive and do not adequately reflect that the effort associated with the first application for a given CO will not have to be repeated with subsequent requests or that the costs will be shared among all collocators within a CO. Based on the evidence in the record, we find that a two-part charge is appropriate, one recurring and one non-recurring, for recovery of planning and initial administrative costs associated with collocation construction. In so finding, we also determine that it is appropriate to incorporate more actual design and engineering work in this initial stage than that which BellSouth proposes. Essentially, we find that AT&T/MCI's proposed "bifurcated" planning charges are appropriate, with certain modifications. We note that AT&T, MCI, and WorldCom all object strongly to BellSouth's proposal that CLECs pay a high up-front charge before CLECs receive any information regarding whether and how much they will ultimately be assessed to prepare a space for collocation prior to construction of the collocation cage itself. We believe that the lower non-recurring charge and subsequent recurring charge will help alleviate some of that concern.

We do not, however, agree with AT&T/MCI's alternative proposal to charge a reduced Application Fee for subsequent collocation requests at the same CO. To the extent that there are one-time labor costs that benefit future collocators, those costs shall be recovered on a recurring basis from all collocators.

Space Preparation

For space preparation, BellSouth proposes an ICB rate. BellSouth demonstrates that the space preparation fee is a one-time fee per arrangement for each location. The fee covers the survey, engineering design, and building/support system modifications for the shared physical collocation area within a CO. It also covers additional "make ready work" specific to the collocator which is not included in the enclosure construction fee.

According to BellSouth witness Redmond, the ICB is necessary because BellSouth has no way to know what collocation will require from one central office to the next. Similarly, witness Varner states that space preparation should be ICB because the work that has to be done in each office has to be determined specifically for that office and for the collocator's needs. Furthermore, BellSouth witness Baeza states:

> Since there is such a variable range of what could be required to provide space for the CLECs, it must be determined on an individual case basis. There is no cookie cutter plan or template that would cover all. One set price for space preparation would have the potential to greatly undercharge one ALEC while greatly overcharging another. Therefore, space preparation must be considered on an Individual Case Basis.

Exhibit 20 at 94.

WorldCom's witness Porter advocates adopting the BellSouth/MFS interim rates. These interim rates include an ICB for space preparation. It therefore does not appear that WorldCom objects to ICB pricing for space preparation. WorldCom does, however, argue that if we do not adopt the interim rates it proposes, we should adopt the AT&T/MCI rate proposal, which does not include an ICB.

Also, AT&T/MCI does not propose a "space preparation" fee. AT&T/MCI does, however, include in its cage construction/planning fee some of the elements that BellSouth includes in its space preparation fee, such as architecture, engineering, and building the physical collocation common area. In addition, the AT&T/MCI model assumes a 150 square feet common area that would be shared by four CLECs.

Furthermore, AT&T/MCI expresses three concerns with ICB pricing. First, AT&T/MCI witness Bissell states that AT&T/MCI does not believe that BellSouth should be allowed to recoup the cost for some of the elements they included in space preparation as an ICB. These items are asbestos removal, construction that is required to bring COs in compliance with Americans with Disabilities (ADA) standards, demolition costs, heating, ventilation, and air conditioning (HVAC), and 48 volt power plant expansion. AT&T/MCI argues that it is also concerned that it would not know the price for space preparation until after it pays the application fee.

BellSouth's proposed application fee is $7,186. In addition, witness Bissell states that AT&T/MCI believes that BellSouth could manipulate the collocators' costs under an ICB by having complete discretion as to where the cage is placed.

As we note, AT&T/MCI believes that the costs for certain space preparation elements should not be recouped through an ICB, and that other elements included in BellSouth's space preparation fee should not be recouped at all. AT&T/MCI points out that the AT&T/MCI model assumes a completely new CO. Therefore, the new CO would not require asbestos removal, demolition, or modification to comply with ADA, for examples. According to witness Klick, the AT&T/MCI model includes the cost of constructing a brand new building that is compliant with all these requirements, even though BellSouth's COs in many cases are 20 or 30 years old. According to witness Bissell, the AT&T/MCI model layouts generate all investments necessary for the provision of collocation, but not for building modifications an ILEC would have to undertake just to bring space in the CO to the level needed to house equipment. Witness Bissell also states that the CLEC should not be required to bear the burden of space preparation costs associated with restoring space to its intended use or for costs required to make CO equipment space suitable for the purpose for which it is being rented. AT&T/MCI acknowledges that the ILEC could include the cost of asbestos removal in the CLEC's rent.

According to BellSouth witness Redmond, the costs of asbestos removal and ADA modifications should only be included when these costs are incurred because of "building out" collocation space. Furthermore, she asserts that if a large area requires modification or asbestos removal, the CLEC will only pay for its share of the space. In addition, she states:

> All construction is subject to the ... ADA. BellSouth performs all new construction in compliance with ADA. All of BellSouth's 'public access' facilities have been brought into compliance with the ADA. Compliance for all other facilities is done as a result of a handicapped employee reporting to that facility, or as rearrangements occur within a building. A percentage of all construction must go toward compliance.

Exhibit 22 at 74.

With regard to asbestos BellSouth only removes asbestos that is friable, which means that the asbestos is readily crumbling or brittle. Undisturbed asbestos is left in place and tagged. Abatement is then triggered by any construction that will disturb this asbestos.

As for demolition costs relating to collocation requests, witness Redmond states that such costs would be incurred infrequently. She explains that BellSouth does not demolish space as it is vacated because the space might be reused for equipment or personnel. She believes it would be "ludicrous" to spend funds on this effort until the space is needed. Furthermore, she testifies that if rearrangements or renovations are required as the space is reused for BellSouth entities, the department that is requesting the space provides the necessary funding. Witness Redmond argues that it should be no different in the case where a CLEC is the entity requesting space. We note that we have reviewed 19 cost estimating spreadsheets for actual collocation projects, and none have any asbestos removal or demolition costs included.

Finally, with regard to HVAC modifications, according to AT&T/MCI witness Bissell, BellSouth should be directed to develop a pre-determined cost for HVAC. He states:

> The design options for CO mechanical systems can vary between large building systems that are typically used to cool multiple areas of the CO and smaller stand-alone units to cool a specific area. However, according to a mechanical systems design consultant used during the development of the MCI/AT&T collocation cost model, the average 'installed' cost of providing HVAC in a telecommunications environment is $1,785.00 per ton of air conditioning, or $24.41 per DC ampere.

Transcript at 1050.

Witness Redmond states that she believes AT&T/MCI's HVAC assumption is not reasonable. She then states that she believes that there is no precise method to meet the HVAC needs of collocators. Furthermore, she states that BellSouth will always evaluate existing systems for capacity and for possible use for collocation.

Conclusion

Upon review of the evidence and arguments presented, it appears that an ICB charge is appropriate for most physical collocation space preparation elements when building support system modification, upgrades, asbestos removal, or demolition must be done to fulfill a CLEC's request for physical collocation. BellSouth states that it will pro-rate the common space preparation costs among all collocators based on the number of square feet requested. We note that while we agree that a forward-looking approach is appropriate, we do not agree with AT&T/MCI's "new CO" approach, because BellSouth will not be constructing a new CO to house collocators. Therefore, space preparation elements must be addressed.

Furthermore, we note that it is not possible to set specific rates for all conceivable space preparation elements. In order to do so, we would need to know the floor plan and mechanical arrangement of every BellSouth CO. We would also need to know where in that CO the collocator would locate, as well as the collocator's specific needs. Also, because AT&T/MCI argues that the CLEC should not be required to bear the burden of space preparation expenditures, there was little record support for any specific rates for space preparation. The information in the record regarding space preparation costs in BellSouth's cost estimating spreadsheets provides unit costs for asbestos removal, demolition, HVAC upgrades, common walls, and exterior doors. These unit costs appear to be based on contractor estimates. According to these estimates, upgrades for HVAC can cost as little as $800.00 for a relief air damper, and as much as $40,000 for a new CW fan unit.

Because the information regarding space preparation costs is limited, and because it would be almost impossible to anticipate each physical collocation scenario, we find that the most appropriate approach is to simply encourage the parties to work together during this phase of the physical collocation process. In situations where the CLEC disagrees with BellSouth's ICB space preparation charges, the CLEC may request that BellSouth obtain three additional independent estimates. If requested, BellSouth shall provide the additional estimates. We note that this does not appear to be a significant issue at this time based on our review of the 19 cost estimating spreadsheets. As collocators continue to enter BellSouth COs and space becomes limited, however, additional modifications will become necessary. If disputes arise, the

parties may bring disputes to us if they are unable to resolve them through negotiation.

Based on the evidence, the cost of the survey and engineering design for the shared physical collocation area within a CO are items that should not be an ICB. As we earlier indicate, the AT&T/MCI model includes manpower requirements associated with these items in its Space Preparation/Planning fee, and, as we also earlier discuss, we adopt the approach AT&T/MCI proposes for planning requirements.

The second area of concern for AT&T/MCI and WorldCom is that BellSouth would require the CLEC to pay an application fee in excess of $7,000 before the CLEC receives information regarding the cost for a complete collocation cage. WorldCom argues that BellSouth's most "offensive" charge in its physical collocation model is its application fee. AT&T/MCI argues that under BellSouth's plan, it must pay an "exorbitant" fee just to find out how much BellSouth will charge it to collocate in BellSouth's facilities. AT&T/MCI witness Bissell states that since the space preparation charge is on a case by case basis, it is very difficult for a CLEC to forecast its collocation costs or prepare a business case to enter BellSouth local markets. Furthermore, witness Bissell states that BellSouth's approach creates a barrier to entry and it discriminates against the first collocator in a BellSouth CO, who faces a large space preparation fee.

We believe that we address the CLECs' concerns in adopting AT&T/MCI's Cage Construction element, which includes both a recurring and non-recurring rate. This approach reduces the up-front costs associated with the initial application.

Finally, AT&T/MCI is concerned that BellSouth could manipulate the collocators' costs under an ICB by having complete discretion as to where the cage is placed. AT&T/MCI believes that BellSouth could require the CLEC to locate its cage at the farthest point from a cross connect, thereby increasing costs for cabling. Also, AT&T/MCI asserts that if two spaces were available in a CO, BellSouth could choose the space that requires the most preparation in order to create a barrier to entry.

According to BellSouth witness Redmond, BellSouth and the collocators could negotiate location in a CO. Witness Redmond further states that BellSouth selects collocator locations, not only based on distance from cross-connects, but also on entries and exits, HVAC requirements and demolition requirements to keep costs

down. Based upon these statements, it appears to us that BellSouth is willing to work with the collocator in determining cage location. We emphasize, however, that in negotiating location within a CO, all facets of physical collocation costs should be evaluated prior to choosing the collocation area(s). Location should not be determined based only on how close the CLEC is to the cross-connect.

Space Construction/Cage Preparation

As we discuss above, physical collocation requires the segregation of the CLEC's equipment from that of the ILEC; therefore, some type of enclosure or cage must be constructed. BellSouth proposes a space construction element that has recurring rates. Witness Redmond asserts that the recurring rates cover materials and installation of the equipment arrangement enclosure. The enclosure is constructed of gypsum board walls.

AT&T/MCI's proposal for cage preparation includes the cost of wire mesh and the ancillary equipment necessary for collocation within the cage area, including the cost of HVAC, but excluding racking and grounding, which are shown separately. AT&T/MCI also proposes a recurring rate.

WorldCom advocates adopting the interim rates in the MFS/BellSouth agreement. The rate for space construction in that agreement is a non-recurring rate. According to WorldCom witness Porter, this rate is for a wire enclosure.

While the parties agree that an enclosure is necessary, witness Redmond notes that there is considerable disagreement as to what type of material should be used to construct the enclosure. Here, we address three types of enclosures: wire mesh; gypsum board; and fire rated.

AT&T/MCI and WorldCom advocate the use of wire mesh cages. AT&T/MCI witness Bissell states that AT&T/MCI believes that wire mesh is cleaner, easier to install, safe, and the most cost effective method of providing for collocation. Witness Bissell asserts that a wire cage provides a secure environment because you can see through it. In addition, he argues that it allows for better lighting and air circulation. BellSouth witness Redmond agrees that a wire mesh cage costs less to construct compared to a gypsum board enclosure as BellSouth advocates.

BellSouth advocates the use of gypsum board enclosures. Witness Redmond asserts that BellSouth believes that the wire mesh walls advocated by AT&T/MCI are unsafe because the use of wire mesh raises the possibility of introducing multiple isolated and integrated ground planes in close proximity to each other. Witness Redmond asserts that BellSouth's subject matter experts believe that the introduction of these various ground planes could cause electrocution. Witness Redmond further asserts that the danger of electrocution is present when items are grounded to two different ground planes close enough to each other that a person can touch them both. If there is any current on one of the grounds, the person becomes the connection for the two and could be electrocuted.

Although none of the parties specifically advocates the use of fire-rated walls to construct the cages, witness Redmond indicates that it may be a necessity in order to meet local codes in certain areas. BellSouth presents evidence that in some municipalities, local code officials classify physical collocation enclosures as a multi-tenant building, thereby requiring the enclosures to be constructed of one-hour, fire-rated walls. A fire-rated wall is a certain thickness of gypsum, with solid studs that must go all the way up to the deck of the floor above. A fire-rated wall prevents a fire from spreading. BellSouth also presents evidence that fire-rated walls are more expensive to construct and require more work to install HVAC and cable racking. BellSouth indicates that of the municipalities where BellSouth has received inquiries for physical collocation, Hollywood and Miami are ones where physical collocation has been classified as a multi-tenant building.

In view of the evidence and arguments regarding all three types of enclosures, we find it appropriate to set rates for each type. We note that we were not persuaded by BellSouth's argument that wire cages are unsafe because of grounding issues. In addition, witness Bissell states that wire mesh walling, when properly grounded, is just as safe and as secure a method of division among equipment as gypsum walling. With regard to fire-rated walls, we acknowledge that BellSouth will have to build collocations to meet local fire codes. In addition, we encourage the parties to work together to determine which cage material best meets the parties' needs, as well as the requirements of the CO.

In setting its rates for the various cage enclosures, we use data provided by both AT&T/MCI and BellSouth. For its proposed rates for wire cages, AT&T/MCI obtains price quotes from various contracting sources. In addition, it collects price information

provided by R.S. Means' Building Construction Cost Data and Electrical Cost Data publications for 1997. In most cases, the price quotes differ from the R.S. Means price by less than five percent, and in no cases by more than 20 percent, with the R.S. Means prices typically the higher prices. It therefore chose to use the R.S. Means rate wherever such data existed. AT&T/MCI compares actual estimates with R.S. Means data. BellSouth does not propose any costs for wire mesh construction.

BellSouth develops its cost for gypsum wall enclosures based on actual quotes received. According to witness Redmond, she attempts to estimate what it would cost to construct the individual collocator's enclosure. She develops a mean value for what the total linear feet of gypsum board wall for each arrangement would be. She includes costs for dust barriers, doors, as well as mechanical and electrical considerations. Finally, she assesses architectural and engineering fees at eight per cent of the construction cost. She indicates that these are basic components that are common to all enclosures. The cost study only incorporates these costs. It does not consider any extra items that may be necessary to complete the enclosure, such as floor tile, for example.

AT&T/MCI witness Bissell believes that BellSouth's cost for gypsum walls construction is excessive when compared to the cost in the R.S. Means guide. On review of the actual quotes provided by various contractors to BellSouth and presented as evidence in these proceedings, as well as other evidence, we do not find that BellSouth's estimates for gypsum walls are excessive.

Finally, AT&T/MCI witness Bissell states that BellSouth's proposed rate for a one-hour fire rated gypsum wall is high in comparison to a figure in R.S. Means. The figure in R.S. Means, $27.12 per linear foot, is for an eight-foot high, one and a half hour rated wall. Witness Bissell asserts that BellSouth's rate for a one-hour, fire-rated wall is $115.00 per linear foot. BellSouth witness Redmond explains that the difference is that the walls in BellSouth's COs have a minimum ceiling height of thirteen feet, six inches; not eight feet. In addition, she explains that gypsum board is sold in eight-foot sheets; therefore, there are additional costs, especially labor costs, when using eight-foot sheets for ceiling heights in excess of eight feet. AT&T\MCI witness Bissell agrees that CO walls are typically thirteen feet high.

Conclusion

Based on the arguments and evidence presented, we approve rates for the various types of cage enclosures. These rates are set forth in Table XIII at the end of our discussion of physical collocation. All rates are for 100 square feet. A separate rate has been set for each additional 50 square feet. The cost for each additional 50 square feet is applicable only when ordered with the first 100 square feet. The rate for wire cage enclosures includes: partitioning (posts, fabric, gates, & installation), floor tile, one padlock, electrical equipment, including a light fixture, motion type light switch, outlets, circuit, conduit, and exit light fixture, a phone jack and mesh grounding. The rate for gypsum cage enclosures includes; gypsum board (installed), dust barrier, floor tile, a door, electrical equipment, including a light fixture, motion type light switch, outlets, circuit, conduit, and exit light fixture, and a phone jack. The rate for the one-hour, fire-rated walls includes all the same items as the gypsum cage enclosures, except that the gypsum board is one-hour, fire-rated.

Finally, we find that a CLEC may construct its own cage using its own contractor. Contractors used by the CLECs must, however, meet the same standards as other contractors permitted to work in BellSouth's COs. BellSouth Property Management personnel shall be allowed to monitor and inspect the project in order to maintain the integrity of the CO, as well as the equipment of other collocators.

Floor Space/Land & Building

This element pertains to the rent associated with land and building use. Both BellSouth and AT&T/MCI propose a monthly recurring charge based on the floor space associated with the cage and also a portion of the required common area. According to AT&T/MCI witness Bissell, both proposals use R.S. Means as a source for the building investment as a starting point. Also, he asserts that BellSouth includes real estate costs in other rate elements by applying land and building cost factors to other non-real estate investments. AT&T/MCI uses a land investment amount of approximately $20 per 100 square feet.

Conclusion

After making adjustments to both proposals for cost of capital, depreciation, and other areas as we discuss in Part III, we determine that the parties' proposed rates for this charge are actually very similar. BellSouth proposes a rate per square foot,

while AT&T/MCI proposes a rate per 100 square feet. AT&T/MCI's rate, however, includes the costs for a portion of the common area. Upon consideration of the evidence presented, we find that a per square foot rate is appropriate. This rate shall also be applied to the collocator's proportionate share of the common area. It is set forth in Table XIII.

Cable Installation/Entrance Fiber

BellSouth has proposed a non-recurring Cable Installation Fee per cable which includes 27.5 hours of labor associated with engineering, cross connect, and testing. The AT&T/MCI model proposes a non-recurring Cable Installation Fee-Entrance Fiber per cable, which includes 14 hours of labor for installation, splicing, and testing of the cable. Witness Bissell states that he includes six hours of engineering labor costs associated with cabling in the planning element. Witness Bissell also notes that the main difference in the charges is the engineering labor.

BellSouth also proposes a monthly recurring Cable Support Structure charge per entrance cable, which would cover the use and maintenance of the CO duct, riser, and overhead racking structure to the collocator's equipment. BellSouth assumes that no sharing of these facilities will occur. According to witness Bissell, BellSouth also assumes cable utilization of 50 per cent, 400 feet of cable, and cable rack capacity of 30 cables.

In addition, AT&T/MCI proposes a recurring fee per cable for Entrance Fiber that includes shared cable racks and use of the manhole. Costs would be recovered through an occupancy charge that would ensure that BellSouth costs are recovered, even if a collocation space is not used 100 per cent of the time. The AT&T/MCI model also includes labor for installation from the manhole to the collocation space, but assumes that materials would be provided by the CLEC. AT&T/MCI assumes 85 per cent cable rack utilization, 300 feet cable lengths, and a maximum 74 cables per rack. AT&T/MCI also includes a state-specific Structure Charge for each foot of innerduct. Witness Bissell states that BellSouth includes this charge as part of the cable support structure charge.

Conclusion

When AT&T/MCI's utilization and sharing assumptions are incorporated into the BellSouth TELRIC Calculator, the cost estimates are substantially reduced, and are similar to those in the AT&T/MCI model. Based on the record, therefore, we incorporate

AT&T/MCI's assumptions because we find that sharing facilities will be necessary in the large, urban COs where collocation has been requested to date. We believe that efficient design and BellSouth's plans to congregate collocators require maximum possible utilization and sharing of cable racks and cable holes.

Power

BellSouth proposes a recurring monthly charge per ampere that includes: 48 volt power equipment, redundant feeder fused positions, and emergency backup power. AT&T/MCI divides the power costs between two recurring charges: one for Direct Current (DC) Plant per ampere, and the other for Alternating Current (AC) usage per DC ampere. The AT&T/MCI DC Plant charge includes the same elements as BellSouth's charge, as well as cable and structure from the power plant to the Battery Distribution Fuse Bay (BDFB). The AC usage charge recovers the cost of electricity required to power the 48 volt DC plant.

AT&T/MCI also proposes non-recurring charges associated with power delivery. These consist of three separate non-recurring charges for various power delivery amperage options. AT&T/MCI presents evidence that the costs include the cables and racking from the BDFB to the collocation area. Witness Bissell states that this cost does not appear to be included in BellSouth's cost data. He surmises that BellSouth includes this cost as part of its space preparation charge as an ICB.

In its Guidelines, BellSouth states that any required changes or expansions to electrical infrastructure must be included as part of the ICB charge for space preparation. This could include an outlet/lighting panelboard with a main breaker and individual circuit breakers, feeder breakers, minimum general lighting and electrical systems for general space requirements, and any necessary conduit and cabling.

AT&T/MCI witness Bissell expresses concern that BellSouth is proposing to double recover costs of power plant expansion in its proposed rates. He argues that BellSouth has included the cost of power plant expansion in the space preparation charge, and has also included a recurring charge that would recover these costs on an ongoing basis. Witness Bissell contends that BellSouth is entitled to recover the costs of power plant expansion, but should not be allowed to recover these costs by both methods, because BellSouth would receive a double recovery of its costs. BellSouth witness Baeza denies that BellSouth is double recovering for the cost of

power plant expansions, stating that when the Guidelines refer to charges for power plant expansions, they only include any building construction necessary, and not the addition of batteries, rectifiers, or other plant items. Indeed, the Guidelines specifically state that:

> Should the customer elect to add/build DC power plant, the costs for construction of the power equipment enclosure will be included in the space preparation fee when BellSouth performs the construction. Such enclosure, whether constructed by BellSouth or a contracted vendor, will become the property of BellSouth.

Exhibit 5 at 506.

We note, however, that the Guidelines also state that:

> Additions and/or upgrades to the power plant in any central office should be considered part of the Space Preparation Charge determined at the time of application based on building and space modification requirements for shared space at the requested central office. Alteration of power plant is included in the category of extraordinary costs to BellSouth.
>
> Power Plant requirements should be determined (by BellSouth Capacity Management) during the initial survey/review of the central office. The collocator should be advised as soon as possible if power plant is a factor in the calculation of Space Preparation charges.

Exhibit 5 at 518.

This language indicates to us that BellSouth intends to charge a specific collocator for power plant expansion costs. We believe that this would be inappropriate if BellSouth also intends to assess a recurring charge for power that includes recovery of this investment. Power plant expansions are more appropriately recovered in recurring charges because they will benefit both BellSouth and future collocators. Therefore, power plant investment shall not be included in any space preparation charge

assessed to a collocator. On this point, we encourage BellSouth to clarify its Guidelines in order to avoid any misinterpretation by either BellSouth personnel, regulators, or collocators in the future on this point.

Conclusion

When we incorporate the cost of capital and depreciation adjustments and do the calculations using the same per kilowatt hour rate, we find that the parties' proposed rates are not substantially different. Therefore, based on the evidence in the record, we approve BellSouth's proposed rate structure consisting of a single recurring charge per ampere.

POT Bays

According to BellSouth's Guidelines, collocated equipment will be cabled to a Point of Termination (POT) device which serves as a test point and a physical demarcation between BellSouth and the collocator's equipment. Both BellSouth and the collocator have access to the POT bay. The Guidelines also state that collocators will have the option to provide their own POT bays, and that floor space designated for POT equipment will be controlled by BellSouth. A POT bay is a relay rack approximately seven feet high and less than two feet wide.

Conclusion

BellSouth proposes monthly recurring charges for each cross connect for four different types of POT bays. AT&T/MCI assumes that it will provide their own, and does not propose rates for POT bays. In view of AT&T/MCI's assumption that it will provide its own POT bays, we have not set rates for POT bays. Furthermore, we note that WorldCom asks that AT&T/MCI's proposals be adopted if WorldCom's interim rates are not approved. WorldCom does not provide information regarding rates for POT bays. We shall not set rates, therefore, for POT bays for WorldCom.

Cross Connects

"Cross connects" provide the connectivity between the CLEC's collocation area and the ILEC's facilities. BellSouth and AT&T/MCI both propose rates for cross connects at various transmission speeds. BellSouth proposes recurring charges per cross connect, and non-recurring charges per cross connect order, for 2-wire, 4-wire, DS-1, and DS-3 cross connects. BellSouth's proposed

recurring charge per 4-wire cross connect is simply twice the rate for the 2-wire. AT&T/MCI witness Bissell asserts that BellSouth's non-recurring charges are for labor associated with customer order processing and that BellSouth includes some costs for repeaters for DS-1 and DS-3 cross connects.

AT&T/MCI presents evidence that its proposed non-recurring charge includes the cost of the cabling and terminal blocks used for interconnection. AT&T/MCI assumes that this element is not reusable and therefore treats it as a non-recurring charge. AT&T/MCI does not include separate charges for customer order processing for collocation cross connects. AT&T/MCI states that the labor charge is reflected in AT&T/MCI's Non-recurring Cost model. The evidence shows that AT&T/MCI's recurring charges include costs for shared cable racking and shared MDF, and assume the use of 100 pair cables. AT&T/MCI proposes the same recurring charge for both types of voice grade circuits, 2-wire and 4-wire cross connects, on a per 100 circuit basis. AT&T/MCI also assumes that both Digital Cross Connect System (DCS) and Digital Signal Cross Connect (DSX) circuits are used.

BellSouth assumes that repeaters will be required for five to ten per cent of the cabling. AT&T/MCI disagrees, however, with BellSouth's use of repeaters for CO cabling. AT&T/MCI first notes that even the cable lengths that BellSouth assumes do not require the use of repeaters. AT&T/MCI witness Bissell argues that the FCC has required that repeaters not be included in ILEC cabling costs. Witness Bissell also argues that BellSouth does not include repeaters in its cost study for virtual collocation. He asserts that this indicates that BellSouth does not anticipate that the cable lengths in its own equipment areas would require repeaters. AT&T/MCI witness Bissell claims that including repeaters in physical collocation costs is discriminatory, especially because BellSouth has control over placement of the physical collocation areas.

Our review of the recurring rates for cable proposed by BellSouth and AT&T/MCI shows that the difference in the rates is substantial. BellSouth witness Caldwell sponsors the cable costs in the TELRIC Calculator. BellSouth's collocation witnesses do not, however, specifically address cabling costs in their testimony. Although witness Caldwell is aware that BellSouth disagrees with AT&T/MCI's assumptions for sharing and cable lengths needed to reach the POT bays, she is unable to explain the differences. She simply notes that, in BellSouth's cost study, the distance between BellSouth's equipment and the CLEC POT bay is an

engineering estimate of the average distance. BellSouth also indicates that the estimate assumes a concentration of physical collocation in large, multi-floor metropolitan central office buildings.

With respect to the concerns expressed by AT&T/MCI witness Bissell regarding BellSouth's assumptions of average cable length, cable rack lengths, use of repeaters, cable utilization factors, the number of cables per rack, and sharing of racks by CLECs. witness Caldwell states that these were inputs from BellSouth network and engineering experts. Some of the differences, which are substantial, are caused by the different planning assumptions in the two models with respect to location of collocation spaces relative to the cross connects. According to witness Caldwell, AT&T/MCI's model assumes the use of space close to the cross connects, while BellSouth's numbers reflect what BellSouth believes it can actually achieve, based on discussions with subject matter experts. BellSouth provides no other basis for its estimates and assumptions for cable related elements.

AT&T/MCI witnesses Bissell and Klick testify regarding their own assumptions with respect to cable lengths. They address some concerns of others that the application of the FCC's "first come, first served" criteria, set forth in FCC 96-325 at ¶585, might place newer CLECs at a disadvantage because the first CLECs to request collocation would be able to get available space close to cross connects, while subsequent CLECs would be required to take space farther away resulting in higher cable lengths and costs. Witnesses Bissell and Klick assert, however, that this would not occur under their model assumptions because they calculated cable lengths using "best case" and "worst case" scenarios in terms of cable lengths and distance from the cross connects. They propose that all CLECs pay for cable based on that average length. Under their proposal, no CLEC would be placed at a disadvantage relative to another regardless of their actual locations within the CO.

Another major cause for the difference between BellSouth and AT&T/MCI cable lengths, according to AT&T/MCI witness Bissell, is that BellSouth assumes only "worst case" scenarios with respect to its choice of COs from which to take measurements. Witness Bissell contends that BellSouth has selected only extremely large, urban COs, which contain, among other things, retired-in-place equipment and large empty spaces around and through which cable must be placed. Witness Bissell states that very large COs require longer cable lengths. Witness Bissell contends that only a few of BellSouth's COs actually match this description; therefore, the

more appropriate approach would be to measure cable lengths based on an average of all the COs in BellSouth's territory. Witness Bissell states that the AT&T/MCI model incorporates a three-floor CO that is still likely to be twice the size of an average CO in BellSouth's territory.

BellSouth witness Redmond provides information regarding Florida COs and collocation requests. On review of that information, we note that of 20 COs reviewed for space availability pursuant to a CLEC inquiry, seven were in Miami, five in Orlando, four in Ft. Lauderdale, two in Hollywood, and one each in Perrine and Lake Mary. Of the seven in Miami, one inquiry was made for a downtown Miami CO. According to the data provided, ten firm orders were placed, and seven have been completed. Six of the ten are in Orlando COs, one in Miami, two in Hollywood, and one in Ft. Lauderdale. The collocation order in Miami was in the downtown CO.

Conclusion

The evidence supports our belief that most collocation requests will involve relatively urbanized areas, at least in the near future. We believe also that it is appropriate that cabling lengths reflect this assumption. Although we do not believe that cable lengths should necessarily reflect all the "worst case" scenarios in BellSouth's Florida COs, neither do we believe it is appropriate to give a great deal of weight to the rural COs where it appears unlikely that collocation space will be requested in the near future.

Our intent here is to balance the competing interests of the parties in a way that will allow CLECs the opportunity to enter the market and compete effectively, and still allow BellSouth to recover appropriate costs to provide these elements. We do this by developing average cable and cable rack lengths incorporating estimates provided by both parties. We do not include repeaters because we consider cable lengths that require repeaters to be excessively long. We assume there will be sharing of cable racks by CLECs.

We note that BellSouth estimates its own cable rack utilization is approximately 67 per cent, although it uses a lower factor for physical collocation. AT&T/MCI proposes that 85 per cent be used. Since BellSouth's goal is to establish a single common collocation area in its COs in order to concentrate collocators, we find that it is reasonable to assume that sharing of facilities to manage space and equipment efficiently will take

place. We believe that such sharing of facilities may be more difficult if collocators use small pockets of space, as the AT&T/MCI model advocates. We, therefore, determine that 85 per cent is a reasonable utilization factor for cable racks. Furthermore, we agree with and adopt the AT&T/MCI collocation model's assumption of 75 per cent occupancy to account for space that may not be in use all the time.

AT&T/MCI includes costs for optical circuits, while BellSouth does not. AT&T/MCI witness Lynott notes that BellSouth models only DSX cross connects and plug-ins in their studies. BellSouth does not model a forward-looking technology using DCS, which does not require a manual copper cross connect at the DSX-1. Instead, it models one that performs an electronic cross-connect automatically in two seconds from an upstream OSS/INE provisioning system in a mechanized flow-through manner. AT&T/MCI witness Bissell states that the majority of DS-1 and DS-3 circuits to which CLECs will want to interconnect are currently located on DSX panels. He asserts, however, that in some COs those higher bandwidth circuits may have been relocated to an electronic digital cross connect system. Based on the evidence, we find it appropriate to include DCS connectivity rates and optical circuits based on AT&T/MCI's proposal, and we require BellSouth to offer them, if available. If the parties have any difficulties they cannot resolve themselves, they may seek our assistance in resolving the dispute.

As we earlier note, BellSouth does not provide a specific witness for cross connects associated with collocation. Thus, it is difficult to compare the different approaches used by the parties in developing these rates. AT&T/MCI includes in its proposed non-recurring charges the costs of cabling and terminal blocks used for interconnection on the assumption that they are not reusable. BellSouth incorporates these costs in its recurring charges. AT&T/MCI witness Bissell assumes that these costs are made non-recurring because cabling and terminal blocks are not reusable.

Upon consideration of the evidence and arguments presented, we find it appropriate to approve recurring rates that are based on AT&T/MCI's proposed rate structure, including rates for DCS connectivity and optical circuits.

Security

AT&T/MCI, BellSouth, and WorldCom agree that there is a need for security in the physical collocation environment. There is, however, disagreement as to how security should be provided.

BellSouth proposes security escorts for all physical collocators that do not have a separate entrance. The minimum time to be billed for an escort is a half-hour, based on regular time, overtime, and premium time. The AT&T/MCI Physical Collocation Cost Model assumes no security escorts are required. The model does assume the cost of five security access cards and maintenance for a security card reader.

According to BellSouth witness Redmond, only 58 out of 197 COs in Florida have electronic security card systems. Witness Redmond clarifies that even though 58 COs have card readers, not every relevant door has a card reader. For example, a card reader may be placed on the front door of the CO, while the collocation project may be located by a back or side door that does not have a card reader. She states that the card access system BellSouth uses costs $10,000 per door. Therefore, it is installed in facilities only after BellSouth rationalizes commensurate risk factors.

The AT&T/MCI model includes the cost of the card reader as part of the cost per square foot. The AT&T/MCI Model assumes the cost of a completely new building that would have modern security access. Witness Bissell states that he does not believe there is any new building in the past five years without security access cards. According to witness Redmond, however, the newest BellSouth urban CO was built in 1975. BellSouth's witness Baeza states that in some cases the only space available for physical collocation may be in the middle of a restricted area, and, therefore, a card reader would not work.

Witness Caldwell believes that a card reader and access cards are reasonable security measures, but the cost of a card reader is significant. She believes not all collocators will want to pay for the necessary costs if they can simply use a lock and key.

BellSouth proposes to bill for the security escort in one-half hour increments. BellSouth states that it uses one-half increments to be consistent with the billing structure for labor rates currently used in the virtual collocation tariff and in the state access tariff. Both BellSouth and MCI/AT&T believe the appropriate rate for a security escort is the labor rate of a frame technician.

Finally, AT&T/MCI witness Bissell proposes response times for both maintenance and security escorts. BellSouth does not dispute these response times. Table XII shows the response times AT&T/MCI proposes. We find that they are reasonable, and therefore we approve them. They are shown in the table below.

TABLE XII
Maintenance and Security Escort Response Times

CENTRAL OFFICE TYPE	COMMISSION APPROVED RESPONSE TIME
Staffed & Attended	1 Hour
Staffed & Unattended	4 Hours
Not Staffed & Normal Business Day	2 Hours
Not Staffed & Non-Normal Business Day	4 Hours

Note: Staffed: Technicians scheduled to work in the location. Attended: Hours during which technicians required to be at CO. Normal Business Day: Usually Monday-Friday, 0800 to 1700 hours.

Conclusion

Based on the evidence in the record and the arguments presented, we require the CLEC to pay for the access cards and maintenance in COs where card readers are in place and at the entrance the CLEC will use. Where card readers are not in place, we require CLECs to pay for a security escort. We do not believe one-half hour is required to escort a CLEC representative to the CLEC's collocation. BellSouth does not provide support for that length of time in this record. We find that it is reasonable that security escort services should be billed in increments of one-quarter of an hour and, therefore, we find it appropriate to require that service to be billed on that basis.

Upon consideration, we hereby approve the rates and elements for physical collocation as shown in Table XIII.

TABLE XIII
Physical Collocation-Approved Rates and Elements

ELEMENT	COMMISSION APPROVED UNIT	COMMISSION APPROVED NON-RECURRING RATES	COMMISSION APPROVED RECURRING RATES
APPLICATION FEE/PLANNING FEE	Per Request	$3,248	$15.53
SPACE PREPARATION	Per Request	ICB	not applicable
CAGE CONSTRUCTION			
Wire Cage	Per first 100 sq. ft.	not applicable	$41.99
Gypsum Board Cage			$84.10
Fire Rated Cage			$99.73
Wire Cage	Per Additional 50 sq. ft.	not applicable	$4.14
Gypsum Board Cage			$9.35
Fire Rated Cage			$11.30
FLOOR SPACE/LAND AND BUILDING	Per sq. ft.	not applicable	$4.25
CABLE INSTALLATION	Per Cable	$1,056	$2.77
CABLE RACK		not applicable	$22.94
POWER	Per Amp	not applicable	$6.95

ELEMENT	COMMISSION APPROVED UNIT	COMMISSION APPROVED NON-RECURRING RATES	COMMISSION APPROVED RECURRING RATES
CROSS CONNECTS			
2-wire	Per 100 Circuits	$1,157	$5.24
4-wire	Per 100 Circuits	$1,157	$5.24
DS-1/DCS	Per 28 Circuits	$1,950	$226.39
DS-1/DSX		$1,950	$11.51
DS-3/DCS	Per 28 Circuits	$528	$56.97
DS-3/DSX		$528	$10.06
OPTICAL CIRCUITS	Per Circuit	$2,431	$6.46
SECURITY ESCORT			
Regular Time	Per 1/4 Hour	$10.89	not applicable
Overtime		$13.64	
Premium Time		$16.40	
SECURITY ACCESS CARDS	Per Request (5 cards)	$85.12	not applicable

F. Virtual Collocation

Element Description

According to BellSouth witness Caldwell, virtual collocation provides for the installation of collocator-owned equipment and facilities in BellSouth's central offices in order to connect to BellSouth's network. She explains that virtual collocation arrangements are located in the BellSouth equipment line-up. Collocators place a private fiber entrance facility from outside the central office to an interconnection point designated by

BellSouth. The wiring between the collocator's equipment and BellSouth equipment is completed by a certified vendor.

AT&T/MCI witness Bissell's description of virtual collocation is similar. He adds that typically the CLEC purchases the equipment it wants to use on the ILEC premises, and sells it to the ILEC for a nominal $1.00 sum. The equipment is then installed in vacant space. The ILEC handles maintenance and is reimbursed by the CLEC. Witness Bissell states that when necessary, the CLEC may enter the premises with a security escort. In contrast to physical collocation requirements, he notes that a virtual collocation arrangement does not require construction of cages or investment in cabling for connections, power or grounding.

Rates

BellSouth witness Varner sponsors the BellSouth rates for virtual collocation. Although BellSouth has submitted TSLRIC studies pursuant to our order, as well as TELRIC estimates, witness Varner proposes that the current tariffed rates for virtual collocation be retained. He argues that prices must account for the cost of the element and also reflect the market, regulatory, and competitive conditions that exist for similar services. Since BellSouth currently has approved interstate and intrastate tariffs in place for virtual collocation, he argues that arbitrage would result if we were to set different prices in Florida. He notes that arbitrage opportunities arise when two different rates apply for the identical service.

Witness Varner believes that the current virtual collocation tariffs comply with the requirements of the Act, and that the tariffs were based on costs at the time they were filed in 1994. BellSouth does not, however, offer those costs in support of its virtual collocation proposal in these proceedings. We note that the TSLRIC and TELRIC estimates BellSouth submits for virtual collocation differ, in some cases substantially, from the rates in the tariff.

Floor Space, Power, Cable Support Structure, and Security Escort Charges

As witness Bissel notes, cages are not required for virtual collocation. The necessary elements are an application charge to cover planning and processing of the collocation request, floor space, cable installation, power, cross connect connectivity, and security escorts. In AT&T/MCI's approach, witness Bissell

explains, virtual collocation includes the same investment assumptions for cable racks and building space as with physical collocation.

Both parties' proposals reflect lower manpower requirements associated with the application fee than those for physical collocation. BellSouth proposes 45 hours in its application fee, whereas AT&T/MCI proposes 66 hours. Both propose a one-time, non-recurring charge. AT&T/MCI also proposes that a separate application fee be developed for virtual collocation requests that involve provisioning of additional cable only. Witness Bissell suggests that 20 hours of planning and engineering should be sufficient to reflect this smaller type of installation. BellSouth witness Baeza states that the application fee covers only the cost to review the application to assess the work that needs to be accomplished. As with physical collocation, we agree with AT&T's manpower estimates for virtual collocation, which are greater than those which BellSouth proposes. AT&T's estimates do, however, include more labor associated with design engineering.

Conclusion

Based on the evidence in the record, we find that the manpower requirements to process an application for additional cable for an existing collocator will not be as great as those for an initial application. An initial application would involve planning and engineering for equipment and power, as well as cabling requirements, according to witness Bissell. Thus, we include a separate application fee for virtual collocation requests that involve placement of additional cable.

We develop rates for virtual collocation based on the cost data submitted by the parties in these proceedings. We determine that this is appropriate based on the requirements of the Act. To the extent that BellSouth believes that its intrastate and interstate tariffs must be identical, BellSouth may modify its Florida interstate tariffs. If BellSouth wishes to have region-wide rates for collocation, then it may attempt to accomplish that through negotiations with CLECs.

As for floor space, power, cable support structure, and security escort charges, our findings are the same as those for physical collocation. AT&T/MCI includes a tariffed "structure" charge per foot of innerduct, which it states BellSouth includes in its cable support structure charge. We do not include it because it is already tariffed. Finally, AT&T/MCI includes rates for

connections between collocators in the CO. BellSouth does not propose such rates or address those AT&T/MCI proposes. The Guidelines acknowledge, however, that such connections are permissible. On that basis, we hereby find it appropriate to approve AT&T/MCI's proposed rates, as adjusted, for virtual collocation as shown in Table XIV.

TABLE XIV
Virtual Collocation-Approved Rates

ELEMENT	COMMISSION APPROVED UNIT	COMMISSION APPROVED NON-RECURRING RATE	COMMISSION APPROVED RECURRING RATE
APPLICATION FEE/PLANNING FEE	Initial Request	$4,122	not applicable
	Add'l Cable Request	$1,249	not applicable
FLOOR SPACE/LAND AND BUILDING	Per sq. ft.	not applicable	$4.25
CABLE INSTALLATION	Per Cable	$965	$12.45
CABLE RACK	Per 1/4 Rack	not applicable	$2.24
POWER	Per Amp	not applicable	$6.95
CROSS CONNECTS			
2-wire	Per 100 Circuits	$1,157	$5.02
4-wire	Per 100 Circuits	$1,157	$5.02
DS-1-DCS	Per 28 Circuits	$1,950	$226.39
DS-1-DSX	Per 28 Circuits	$1,950	$11.51
DS-3-DCS	Per Circuit	$528	$56.97
DS-3-DSX	Per Circuit	$528	$10.06
OPTICAL CIRCUITS	Per Connection	$2431	$6.71

ELEMENT	COMMISSION APPROVED UNIT	COMMISSION APPROVED NON-RECURRING RATE	COMMISSION APPROVED RECURRING RATE
VIRTUAL to VIRTUAL CONNECTION			
FIBER	Per Cable	$526.17	$.19
DS-1/DS-3	Per Cable	$134.46	$.17
EQUIPMENT MAINTENANCE AND SECURITY ESCORT			
Regular Time	Per 1/4 Hour	$10.89	not applicable
Overtime		$13.64	
Premium Time		$16.40	

G. Directory Assistance and Dedicated Transport

Definitions

Operator Systems

In FCC 96-325 at ¶534, the FCC determined that incumbent LECs must provide access to operator services and directory assistance facilities where technically feasible. In FCC Rule 47 C.F.R. § 51.5, operator services and directory assistance are defined as follows:

> 'Operator services' are any automatic or live assistance to a consumer to arrange for billing or completion of a telephone call. Such services include, but are not limited to, busy line verification, emergency interrupt, and operator-assisted directory assistance services.
>
> 'Directory assistance service' includes, but is not limited to, making available to customers, upon request, information contained in directory listings.

In its order, the FCC explained:

> We conclude that incumbent LECs are under the same duty to permit competing carriers nondiscriminatory access to operator services and directory assistance facilities as all LECs are under section 251(b)(3). We further conclude that, if a carrier requests an incumbent LEC to unbundle the facilities and functionalities providing operator services and directory assistance as separate network elements, the incumbent LEC must provide the competing provider with nondiscriminatory access to such facilities and functionalities at any technically feasible point. We believe that these facilities and functionalities are important to facilitate competition in the local exchange market. Further, the 1996 Act imposes upon RBOCs, as a condition of entry into in-region interLATA services the duty to provide nondiscriminatory access to directory assistance services and operator call completion services. We therefore conclude that unbundling facilities and functionalities providing operator services and directory assistance is consistent with the intent of Congress.

Order 96-325, ¶ 534.

Dedicated Transport and Common Transport

Our review of the applicable FCC rules shows us that the FCC considers dedicated and common transport as interoffice transmission facilities. It defines these facilities as follows:

> (1) Interoffice transmission facilities are defined as incumbent LEC transmission facilities dedicated to a particular customer or carrier, or shared by more than one customer or carrier, that provide telecommunications between wire centers owned by incumbent LECs or requesting telecommunications carriers, or between switches owned by incumbent LECs or requesting telecommunications carriers.

47 C.F.R. § 51.319.

Pursuant to Order PSC-96-1579-FOF-TP, BellSouth is required to provide CLECs with access to Dedicated Transport and Directory Assistance Transport.

Rate Element Descriptions

The rate elements and respective descriptions for the Directory Transport UNEs are set forth below. Only non-recurring charges for Dedicated Transport DS1 Interoffice per Facility Termination will be set in these proceedings, because recurring rates for this element were previously set in Order No. PSC-96-1579-FOF-TP.

Local Channel DS1

This rate element provides the transmission path and associated electronics between switching locations that enable a call to be transported from one location to another. The evidence in this record demonstrates that these facilities are dedicated to a single network provider between BellSouth end offices and tandem offices and CLEC end offices. This segment includes dedicated or common transport from the Point of Presence (POP) or Point of Interconnection (POI) to the Serving Wire Center (SWC) and to the Access Tandem, Local Channel (LC), and Interoffice Transport.

DS1 Interoffice per Mile, DS1 Interoffice per Facility Termination (Directory Transport and Dedicated Transport), and DS1 Interoffice per Trunk or Signaling Connection

Each of these rate elements provides a transmission path and the associated electronics between BellSouth's end offices so that a CLEC can transport DS1s from one location to another. These facilities are dedicated to a single network provider.

Recurring Rates

BellSouth uses its TELRIC Calculator to develop the recurring rates that it proposes for these UNEs. AT&T/MCI's proposed recurring rates for these UNEs are also developed using BellSouth's TELRIC Calculator, but with AT&T/MCI's proposed inputs and assumptions. All of the adjustments to the Local Channel DS1 and DS1 Interoffice Per Mile and Per Facility termination rate elements are adjustments for depreciation, cost of money, income tax

factors, plant specific factors, ad valorem factors, and shared cost factors.

Conclusion

Based on the evidence in the record and applying our decisions above in Part III, we hereby approve the recurring rates for the rate elements of Directory Assistance Transport shown in Table XV.

TABLE XV
Approved Recurring Rates for Rate Elements for Directory Assistance Transport

Rate Element	Commission Approved Rate
Local Channel DS1	$43.64
DS1 Interoffice Per Mile	$0.6013
Per Facility Termination	$99.79

Non-recurring Rates

BellSouth uses its TELRIC Calculator to develop non-recurring costs. The process for developing the non-recurring costs for UNEs, which yields TELRIC costs, is described above in Part III.B.

AT&T/MCI uses its NRCM to develop the non-recurring costs for the DS1 Interoffice Per Facility Termination rate elements. Witness Ellison states that:

> the non-recurring cost model multiplies individual work activity times by the applicable rate per hour to determine the activity cost. After the total costs of provisioning the service type are calculated, the model sums the costs and applies an 'overhead factor' to arrive at the total cost of provisioning that service type.

AT&T/MCI's proposed nonrecurring rates for the remaining rate elements of these UNEs are developed using BellSouth's TELRIC Calculator and AT&T's proposed inputs and assumptions.

Forward-Looking Technology

ATT/MCI witness Lynott states that forward-looking network architectures are important because they are intelligent, processor-controlled network elements that can communicate over standard interfaces to the OSSs in such a manner that little or no manual intervention is required for provisioning or maintenance activities.

BellSouth witness Caldwell states that some of the interfaces AT&T advocates are available but not to the extent described by witness Lynott. Witness Caldwell contends that it is not presently possible to mechanize totally the connection from the CO to the customer's premises.

BellSouth witness Varner states that BellSouth proposes using the cost of equipment that is required to provide these elements in the future. Witness Varner asserts that the CLECs propose using the cost of hypothetical equipment that will not be used and in some cases is non-existent. Witness Lynott asserts, however, that BellCore specifications are currently available for electronic interfaces and he contends that this technology is available.

BellSouth witness Zarakas states that the cost study that BellSouth presents is based on an efficient and forward-looking technology. Although BellSouth asserts that its cost study reflects forward-looking technology, BellSouth witness Landry states that digital cross connects are not considered in the studies; instead, manual cross connects are used.

Conformance Testing

Witness Lynott states that AT&T/MCI's NRCM assumes certain levels of testing. Witness Lynott states as an example, that the model recognizes continuity-type testing to insure connectivity. The costs of conformance-type testing, which is necessary to insure that installed facilities deliver services meeting the required specifications, are captured, however, within the maintenance loading for recurring rates. This is because this testing is performed during the EF&I phase associated with plant placement. We note that BellSouth does agree with AT&T witness Ellison's allocation of costs to recurring and nonrecurring costs.

Conclusion

Upon consideration, we find that BellSouth may recover costs associated with conformance testing in the EF&I phase of the plant placement process in recurring charges. Therefore, we do not allow BellSouth's proposed non-recurring engineering costs.

Work Times

AT&T witness Hyde asserts that BellSouth's cost studies consistently include errors that result from incorrect application of BellSouth's own methodologies. Witness Hyde notes, as an example, that BellSouth's model does not recognize the currently available OSS systems that allow CLECs to interface with BellSouth electronically. AT&T/MCI witness Lynott asserts that AT&T/MCI's model contains the necessary work steps, activities, and work times required to order and provision the UNEs at issue. Following the model's costing guidelines, he states that AT&T/MCI makes adjustments to recognize electronic ordering, efficiently managed OSSs, and forward-looking network architecture benefits. AT&T/MCI only uses its model for the non-recurring costs for DS-1 Facility Termination.

AT&T/MCI witness Lynott states that his assumption of four activities per trip is based on load and work time record samples from the Work Force Administration (WFA) system, a system used by all of the RBOCs. BellSouth witness Landry states that the WFA system is an electronic system for coordinating the dispatch of technicians and monitoring the completion of service turn-ups, among other things. He also states that there are some limitations to the WFA system's capabilities. Witness Landry points out that the effect of the electronic capabilities of the WFA system is reflected in the work times, which are provided by the network subject matter experts. Witness Landry also states that witness Lynott uses substantially lower work times. He asserts that witness Lynott considers many functions that are in fact necessary to be unnecessary, causing the work times and associated costs AT&T/MCI proposes to be understated.

BellSouth proposes work times of 0.4167 hour for a first installation, and 0.4167 hour for each additional installation. AT&T/MCI proposes work times of 0.4867 hour for a first installation, and 0.4200 hour for each additional for the DCS Connect & Test function, which is one of the activities associated with establishing the DS-1 local channel.

BellSouth proposes one activity per trip for the installation of a digital cross-connect system, whereas AT&T/MCI proposes four activities per trip. BellSouth witness Caldwell agrees that the 20 minutes for travel time proposed by AT&T/MCI is in accord BellSouth's estimates.

Conclusion

We believe it is significant that, while AT&T/MCI uses data from the WFA system and network subject matter experts as the basis for the work times it advocates, BellSouth uses Florida-specific data from network subject matter experts as the basis for its work time proposals. Having reviewed the job function descriptions and the respective work times provided by the parties, we accord the greater weight to the work times BellSouth proposes because it has actual operations records for these functions, which make its proposed work times more reliable. Therefore, we find it appropriate to reduce BellSouth's proposed work times by 25 per cent of the difference of the respective work times proposed by BellSouth and AT&T/MCI.

We adjust AT&T/MCI's proposed work activities and times in order to determine the appropriate DCS installation work times. First, we remove the work times associated with ordering activities for the reasons set forth in Part V below. Next, we determine that BellSouth's assumption of one work activity per trip is not reasonable. We do not believe it is consistent with an efficient, forward-looking installation process. AT&T/MCI's assumption of four activities per trip, however, appears to us optimistic. We, therefore, find it reasonable to use a middle-range of two work activities per trip. Thus, the work time for DCS cross connect installation that we approve is 0.3550 hour. Tables XVI-XVIII show the installation work times we find appropriate to approve.

TABLE XVI
Ds-1 Local Channel-work Times Rate Element for Directory Assistance Transport

Function	Code	Commission Approved Installation Work Times, Hours	
		First	Additional
Engineering	32XX	2.2500	2.2500
Engineering	470X	0.3725	0.3725
Engineering	400X	0.0122	0.0116
Engineering	341X	0.0375	0.0000
Connect & Test	431X	0.3550	0.3550
Connect & Test	411X	1.6208	1.6042
Connect & Test	471X	0.0000	0.0000
Travel	411X	0.3000	0.0000

TABLE XVII
DS1 Level Facility Termination Rate Element for Directory Assistance Transport and Dedicated Transport

Function	Code	Commission Approved Installation Work Times, Hours	
		First	Additional
Engineering	341X	0.0250	0.0000
Engineering	31XX	0.0000	0.0000
Connect & Test	470X	0.3725	0.3725
Connect& Test	471X	0.0000	0.0000
Connect & Test	431X	0.6781	0.6640

TABLE XVIII
Installation per Trunk or Signaling Connection Rate Element for Directory Assistance Transport

Function	Code	Commission Approved Installation Work Times, Hours	
		First	Additional
Engineering	4N2X	2.2500	0.0500
Connect & Test	430X	2.0000	0.0000

Table XIX shows the nonrecurring rates that we approve for each of the UNEs associated with interoffice transport. The DS1 Facility Termination rate applies to both Directory Assistance and Dedicated Transport, while the other two rate elements apply only to Directory Assistance.

TABLE XIX
Nonrecurring Rates

Rate Element	Commission Approved Rate, Installation	
	First	Additional
Local Channel DS1	$242.45	$226.44
DS1 Facility Termination	$45.91	$44.18
Installation Per Trunk or Signaling Connection	$332.42	$8.82

H. 4-Wire Analog Port

Element Definition

We determined in Order No. PSC-96-1579-FOF-TP that incumbent LECs must provide local switching as an unbundled element. 47

C.F.R. §51.319(c)(1)(i) defines the local switching element to encompass:

> (A) line-side facilities, which include, but are not limited to, the connection between a loop termination at a main distribution frame and a switch line card;
>
> (B) trunk-side facilities which include, but are not limited to, the connection between trunk termination at a trunk-side cross-connect panel and a trunk card; and
>
> (C) all features, functions, and capabilities of the switch which include, but are not limited to:
>
> (1) the basic switching function of connecting lines to lines, lines to trunks, trunks to lines, trunks to trunks, as well as, the same basic capabilities made available to the incumbent LEC's customers, such as telephone number, white page listing, and dial tone; and
>
> (2) all other features that the switch is capable of providing, including but not limited to custom calling, custom local area signaling service features, and Centrex, as well as any technically feasible customized routing functions provided by the switch.

The local switching element consists of the actual switch functionalities and the port. According to BellSouth witness Caldwell, the port is the facility used to connect a loop to an end office or local switch. Witness Caldwell also states that the port facility includes required signaling and transmission plug-ins, which are necessary to convert the 4-wire signaling to 2-wire signaling on incoming calls, and conversion from 2-wire to 4-wire signaling on outgoing calls. According to AT&T witness Ellison, the 4-wire port is identical to the 2-wire port already priced; i.e., the 4-wire port is simply a 2-wire port bundled with signaling and terminating equipment.

We also established usage charges for local switching and recurring and non-recurring rates for the 2-wire port in Order No. PSC-96-1579-FOF-TP. In these proceedings, we establish recurring and non-recurring rates for the 4-wire port.

Cost Models

The parties use two models in the development of costs for the 4-wire port. BellSouth uses BellCore's SCIS to develop switch-related costs. BellSouth witness Garfield states that SCIS is a PC-based software application that determines the switching investment required to provide end users with services and features. SCIS determines switching investment by taking engineering and pricing information obtained from switch manufacturers and combining that with a particular carrier's network configuration and demand characteristics to calculate the cost of switching functions and features. SCIS is a proprietary model. Although it has been provided for review in this proceeding, public disclosure of the model's internal design is prohibited. None of the parties contested the accuracy of the model.

BellSouth witness Garfield explains that there are two programs in the SCIS model that determine investment amounts for features and services provided by central office switching machines. First, the SCIS Model Office program (SCIS/MO) determines investment amounts for the functions that a switch performs. The other program is the SCIS Intelligent Network (SCIS/IN), which calculates the investment required to provide a given feature or service. AT&T witness Petzinger argues, however, that while BellSouth uses the SCIS/MO program to calculate the investments for the 4-wire port, it does not actually use the SCIS/IN program to develop the investments for the features provided by the switch. We discuss the use of SCIS/IN and vertical features more extensively below.

BellSouth witness Caldwell states that SCIS uses Florida specific switch data, including: office characteristics and traffic patterns, parameters of the switch being studied, and vendor information, including technical descriptions and prices. BellSouth uses SCIS to calculate the investment amount attributable to the port. Witness Zarakas states that BellSouth then inserts the SCIS-generated port investment amount into the TELRIC Calculator to determine the recurring rate. AT&T/ MCI also relies on SCIS to develop the port investment amount and uses BellSouth's TELRIC Calculator to develop the rates for the 4-wire port. In

addition, when determining the proposed rate for the port, BellSouth adds the RRR.

Recurring Rate

The cost analysis for the 4-wire analog port demonstrates that there are two material components: the port investment and the signaling and terminating equipment, which converts signals from 2-wire to 4-wire. AT&T/MCI does not dispute the material or investment amount BellSouth proposes for the signaling and terminating equipment. It does, however, disagree with the investment amount proposed by BellSouth for the switch that is applicable to the port.

SCIS: Average mode vs. Marginal mode

According to AT&T witness Petzinger, in the 1970's, SCIS was originally designed to determine average switching costs. She asserts that the assumption at the time was that all elements of the switch should be considered usage sensitive in order to determine the average cost of vertical features and services. Witness Petzinger explains further that in the late 1980's and early 1990's, incremental costing became more prevalent and the ability to calculate marginal costs was added to the model. Witness Petzinger states that the marginal mode in SCIS distinguishes between items that are fixed costs and those that are variable costs. If an investment is classified as a fixed cost by the model, then that investment will not be recovered on a usage basis, as a variable cost would.

BellSouth witness Garfield agrees with witness Petzinger, stating that SCIS was originally developed using average costing methods only. Witness Garfield states that SCIS was enhanced to accommodate both average and marginal costing methods to keep up with the changing needs of local exchange carriers. Witness Garfield asserts that the choice to run SCIS in one mode over the other is not dependent on individual hardware components of a switching system, but is a choice made by BellSouth's subject matter experts.

BellSouth witness Garfield states that SCIS/MO, when run in the average mode, is designed to apportion switch investment over demand to assure total recovery of the switch. Witness Garfield also states that SCIS, when run in the marginal mode, determines the investment associated with the next unit of demand. He states that marginal cost results are typically less than average cost

results, because fixed or shared investments are treated differently in each mode.

AT&T witness Petzinger states that it is incorrect for BellSouth to run SCIS in the average mode. She states that when SCIS is run in the average mode, the model automatically assigns the "Getting Started Investment" as a traffic sensitive investment. Witness Garfield further states that the "Getting Started Investment" consists of: the central processor and related equipment; maintenance and test equipment; spare components; miscellaneous equipment; and investment for under-utilized equipment. Witness Petzinger states that SCIS defines "Getting Started Investment" as that equipment that is required to get a switch up and running without respect to size and traffic.

Witness Petzinger states that SCIS, when run in the average mode, assigns the "Getting Started Investment" as traffic sensitive, because of an assumption that the switch will be replaced when the processor's capacity becomes depleted. Witness Petzinger states that BellSouth assumes that switch processor utilization at the time of replacement would be 28 per cent. Witness Petzinger states that switch capacity will not become depleted. This is vindicated, she argues, by BellSouth's own input into the SCIS model, which indicates that BellSouth's switches in Florida are currently utilizing only 27 per cent of processing capacity. She concludes therefore that switch processor capacity would not become depleted during the life of the switch. Witness Petzinger asserts that the marginal mode of SCIS does not treat the processor investments as traffic sensitive if those investments are not expected to become depleted. She states that, instead, these investments are treated as fixed costs that are required to make the switch operational over its life.

BellSouth witness Caldwell disagrees with AT&T witness Petzinger's assertion that the "Getting Started Investment" should be allocated to the non-traffic sensitive portion of the port investment. Witness Caldwell states that BellSouth referred to the actual function in the switch that will use the "Getting Started Investment." Witness Caldwell argues that the cost should be assigned to the call processing millisecond, because that creates the need for the switch. BellSouth witness Garfield states that SCIS, when run in the average mode, will compute a "Getting Started Investment" per millisecond based on the switch's average processor utilization over the life of the switch, as opposed to current processor utilization only.

BellSouth witness Garfield also disagrees with AT&T witness Petzinger's proposal for allocation of the "Getting Started Investment." Witness Garfield states that the allocation of the "Getting Started Investment" over the total number of lines that exist today, and not the total number of lines expected to be served over the life of the switch, will result in an over-recovery of the "Getting Started Investment."

AT&T witness Petzinger counters by stating that, in addition to the processor, there are numerous other items in the "Getting Started Investment." Witness Petzinger states that BellSouth has treated all of the "Getting Started Investment" for every switch as traffic sensitive. Witness Petzinger asserts that this treatment of the "Getting Started Investment" violates the basic principle of reflecting costs based on causation, and, therefore, the non-traffic sensitive "Getting Started Investment" should be assigned to the non-traffic sensitive port element.

We note that BellSouth witness Caldwell, when asked to verify BellSouth's inputs into the SCIS model, including BellSouth's 27 per cent input for switch processor capacity utilization, responded that she was unfamiliar with the program and therefore could not verify any of the inputs used in the model.

Switch Contract Prices

AT&T witness Petzinger explains that the SCIS model contains current list prices from various switch vendors. The SCIS user then enters the contract discount as an input into the model. The model then calculates the appropriate switch unit investments. She states that BellSouth has, however, several types of switch contracts with various switch vendors. BellSouth has contracts with NorTel for DMS 100 switches, contracts with Lucent for the 5ESS switches and a contract with Siemens Stromberg-Carlson. Witness Petzinger asserts that these contracts fall under one of two types: contracts for new switches or contracts for adding growth capabilities to existing switches.

Witness Petzinger states that she reviewed the Nortel and Siemens switch contracts and three Lucent switch contracts. She states that BellSouth used the prices from the Nortel contract and from two of the three Lucent contracts. The two Lucent contracts consist of a general contract negotiated in 1992 and a newer growth contract. According to witness Petzinger, the manner in which BellSouth uses these contracts results in a per line price that is two and a half times the prices witness Petzinger reviewed in

BellSouth switch contracts. Witness Petzinger asserts that BellSouth used the higher priced cost of a switch from the general contract and applied it to one small category known as the "Getting Started Investment." She further asserts that for all other equipment, and for every line ever installed in all of BellSouth's service territory, BellSouth applied the higher growth price contained in the older Lucent contract.

Witness Petzinger states that she does not use the switch price from the Nortel contract or any switch growth prices. She indicates that she uses only the replacement switch price from the 1996 Lucent contract in the SCIS model. Witness Petzinger asserts that a replacement switch contract typically contains a lower per line price then does a growth contract. In other words, the cost per line to add equipment that will provide additional lines to an existing switch is typically higher than the per line cost of a new switch.

Witness Petzinger supports her position for the per line price that she uses by stating that it is an actual BellSouth contract price. Witness Petzinger demonstrates that it is neither the highest nor lowest BellSouth contract price. In addition, she asserts that it is unreasonable to believe that BellSouth would purchase switches out of its higher price contracts, when it has lower prices in other contracts. In addition, witness Petzinger explains that she takes into consideration higher growth prices. She further explains that a net present value analysis plays a significant part in switching investment, stating that:

> I did take into account the concept that a higher growth price exists. The reality is it isn't relevant, and the reason it's not relevant is because you have an option to buy today at a lower price and then you can pay a higher price tomorrow and next year and the year after that. At some point in the life cycle of that switch, it will be cheaper in today's dollars to buy at the higher growth price. The reality is, that insures that the maximum price you will ever actually pay is the new switch number. You're only going to go and buy out of the higher growth price number when it's actually cheaper to do so in today's dollars.

Transcript at 1638-1639.

Witness Petzinger states that the process used by BellSouth is performed outside SCIS. That is, the methodology for determining which BellSouth switches are priced at which contract price is not a part of the SCIS model. Witness Petzinger asserts that it is the result of the calculation that is used as an input into SCIS. BellSouth witness Garfield also states that the process involves taking the information in the contract and developing the appropriate number that goes into the system. There is more to it than just matching a number in the contract to what is in the system. Witness Petzinger states that she cannot make out, in either the cost study papers or in the CD-ROM provided by BellSouth, the methodology used by BellSouth.

When asked to verify the per line prices she identifies in her testimony as those prices that BellSouth used as inputs to the SCIS model, witness Caldwell stated that she is unable to verify that those prices were input into the SCIS model. She provides some calculations in order to show how BellSouth derives its proposed per line price for both the Nortel and Lucent switches, which do not, however, show how many lines were associated with new switches, and how many lines were obtained under the growth contract. The calculation only shows the total cost for lines associated with Lucent switches and the total cost for lines associated with the Nortel switches. BellSouth then uses these numbers to calculate a melded per line switch cost.

In view of the limited evidence presented, we are unable to determine whether or not BellSouth applies the switch prices correctly to develop an appropriate melded rate. Therefore, we are unable to verify that the per line prices BellSouth proposes are accurate. AT&T witness Petzinger's analysis includes more contract information than BellSouth provides, and we find her analysis more persuasive.

Treatment of Vertical Features

BellSouth witness Caldwell states that switch features are incremental to the port and local switching. She also states that the feature components consist mainly of right-to-use (RTU) fees and processor usage over and above the processor usage to switch a call. The local switching usage rates that we set in Order No. PSC-96-1579-FOF-TP included processor usage for vertical features. We believe that this is consistent with the FCC's definition that all features, functions and capabilities of the switch are included with the switching element. See FCC 96-325, ¶423.

As we state above, the local switching usage rates that we set earlier were developed to recover costs associated with processor usage for vertical features. The local usage rates that we set here apply regardless of which port is used. AT&T witness Ellison states that the 4-wire port is identical to the 2-wire port that we have already priced, except that the 4-wire port is simply a 2-wire port bundled with signaling and terminating equipment. Witness Ellison states further that adding this additional equipment to the 2-wire port should not cause the pricing structure to change, but should reflect only the cost of the added equipment. We note that individual rates for vertical features were neither proposed nor established in the original arbitration proceedings for these parties. The AT&T and MCI interconnection agreements with BellSouth reflect our decision that there shall be no additional charge for use of features, functions and capabilities of the switch.

Conclusion

The parties' respective port investment amounts represent for us the investment boundaries. BellSouth uses contract prices for all Lucent switches from its oldest, highest priced contract. The Lucent switches represent the majority of switches in use in BellSouth's network. AT&T/MCI proposes using one contract price as a surrogate for all of BellSouth's switch contract prices, including the Lucent and NorTel switch contracts. There is, however, insufficient evidence in the record to support either party's port investment amount. Therefore, having weighed the evidence presented, the investment amount we approve is the average of the investment amounts proposed by each. In view of the limited support provided by the parties, we believe that this is a reasonable and therefore appropriate solution.

The 4-wire port recurring rate we approve does not include any change to the portion of the investment attributable to the signaling and transmission equipment. AT&T/MCI does not dispute BellSouth's proposed investment amount attributable to the signaling and transmission equipment. Therefore, we believe that the recurring rate for the 4-wire port should be based on the average of the two investment estimates provided by the parties, which are amounts attributable to the port, and the agreed-upon investment amount for the signaling and transmission equipment. In addition, the rate shall reflect the adjustments to the cost of capital, depreciation, and shared and common cost factors we determine above in Part III. Also, the rate we approve does not include the amount attributable to BellSouth's proposed RRR. Based

on the evidence in the record, we hereby approve a recurring rate of $9.14 for 4-wire port.

Non-recurring Rate

The non-recurring charge for the port is developed in BellSouth's TELRIC Calculator. AT&T/MCI does not use its NRCM to develop its proposed non-recurring costs for the port. Instead, AT&T/MCI chooses to use the TELRIC Calculator with its own inputs. The non-recurring cost development, as proposed by BellSouth, includes five job functions: Customer Point of Contact; Network Services Clerical; Recent Change Line Translations (Recent Change Memory Administration Group (RCMAG)); Central Office Installation and Maintenance; and Account Customer Advocate Center (ACAC).

The parties differ in their proposed work times for each of the five job functions. BellSouth, AT&T and MCI all use the TELRIC Calculator to develop the non-recurring cost for the port. The combined analyses of AT&T and MCI reflect their own adjustments to BellSouth's cost study. On review, we note that the work times AT&T/MCI proposes represent the "best case" scenario for provisioning a 4-wire port. Based on the evidence presented, it appears to us that this scenario assumes a technologically efficient OSS such that manual intervention is negligible. BellSouth's proposal represents work times that are greater. We note that, in accordance with Order No. PSC-98-0123-PCO-TP, we remove the Customer Point of Contact and ACAC functions.

Witness Lynott explains that the difference between the work times in BellSouth's proposal and AT&T's proposal is due to BellSouth's position that RCMAG would perform the manual input for switch translations. We note that switch translations must be performed when a port is provided to a CLEC, and that the translations inform the switch as to which company the customer is assigned. This is similar to the PIC change that occurs when an end user changes long distance carriers.

Conclusion

Witness Lynott assumes that a line translation in the switch should flow through from the service order processor to the switch. Hence, no manual intervention would be incurred. He assumes, however, that the loop and port that are currently serving the end user will be provided "as-is" to the CLEC. "Migration" by means of UNEs is an issue that was severed from this proceeding to be addressed in Docket No. 971140-TP. Accordingly, we do not comment

on that issue here. For purposes of these proceedings, we therefore assume that the local switching function is ordered as a single network element unbundled from other network elements. Under this assumption, the port provided by BellSouth may be connected to a loop provided by the CLEC. In that case, we believe that the evidence shows that the switch must be updated with new instructions to route the call accordingly. These instructions can only be entered manually by BellSouth. The work time of 0.0078 hour AT&T/MCI proposes, which is switch processor time only, does not reflect the time necessary for manual input of the switch translations. Therefore, we hereby approve the RCMAG work time BellSouth proposes.

The work time AT&T/MCI proposes for the Network Services Clerical function is very small. Witness Lynott does not explain this function. BellSouth provides persuasive support for the work time it proposes for this function. We find the work time BellSouth proposes reasonable, and we therefore approve it.

TABLE XX
WORK TIMES FOR 4-WIRE PORT

Function	Description	Commission Approved Installation Work Times, Hours	
		First	Additional
Connect & Test	Network Services Clerical	0.0104	0.0104
Connect & Test	Recent Change Line Translation	0.0250	0.0250
Connect & Test	Central Office Installation & Maintenance	0.1000	0.1000

Based on the evidence in the record and for the reasons stated above, we hereby approve a nonrecurring rate of $5.86 for a 4-wire port. The rate we approve is for both initial and additional orders.

V. OPERATIONAL SUPPORT SYSTEMS

In Order PSC-98-0123-PCO-TP, we granted in part and denied in part the Joint Motion to Strike Testimony and Exhibits regarding OSSs filed by AT&T, MCI, and WorldCom. We granted the Motion with respect to all testimony and exhibits pertaining to the costs of OSS functions developed specifically for the CLECs, both manual and electronic.

Although the FCC and the Eighth Circuit have indicated that OSSs are considered UNEs, OSSs were not identified in Order No. PSC-97-1303-PCO-TP, Order No. PSC-96-1579-FOF-TP, or Order No. PSC-96-1531-FOF-TP as UNEs for which permanent rates would be set in these proceedings. However, even though we will not set rates for OSSs or access to OSSs in these proceedings, BellSouth has a statutory obligation to negotiate or arbitrate this issue when requested to do so by a CLEC.

We denied the Motion with respect to testimony and exhibits addressing BellSouth's proposal to recover shared and common costs associated with its legacy systems (OSSs in place prior to competition) through the UNE rates proposed in these proceedings. We ordered each party to compile a list to be presented at the hearing identifying its respective testimony and exhibits pertinent to establishing rates for OSSs (i.e., manual and electronic) to be stricken.

OSSs are the electronic, software driven computer programs and databases that BellSouth uses to manage its pre-ordering, ordering, provisioning, repair, maintenance and billing processes for both its retail and wholesale operations. We identify two types of OSSs in these proceedings. First, we identify BellSouth's legacy systems, such as Trunk Information Record Keeping System (TIRKS), Computer System for Mainframe Operations (COSMOS), Loop Facilities Assignment Center (LFAC), Assignment Facilities Inventory Group (AFIG), and Circuit Provisioning Group (CPG). Most of the costs associated with BellSouth's legacy systems are related to electronic, software driven computer programs and databases. Thus, these costs are presumably capitalized in BellSouth's investment accounts and recovered in its shared and common costs. Second, we identify OSSs that were developed specifically for the CLECs' use, such as Local Exchange Navigation System (LENS), Electronic Data Interchange (EDI), LCSC, and ACAC. In addition to a charge per electronic order, BellSouth proposes to recover the costs associated with these systems through its NRCs, manual and electronic.

WorldCom argues that BellSouth has not removed all of its costs related to the establishment of manual and electronic OSS rates. Specifically, it argues that BellSouth should exclude the LCSC costs. The LCSC was designed specifically for the CLECs' use to process the local service order for BellSouth to provision. Even though the LCSC work group in the ordering and provisioning processes is dedicated to the CLEC, BellSouth witness Varner argues that BellSouth should not have to incur the additional costs for this center. Therefore, it did not remove LCSC costs from its cost study. Instead, witness Varner maintains that BellSouth removed the $10.99 rate associated with the systems that a CLEC would use if it were to place an order electronically. In fact, witness Varner stated that all of the electronic interface costs such as LENS and EDI, were excluded from the non-recurring costs. He believes that this is consistent with Order PSC-98-0123-PCO-TP, as well as Order PSC-96-1579-FOF-TP, which provides that each party shall bear its own cost of developing and implementing electronic interface systems.

Despite our direction in Order PSC-96-1579-FOF-TP, at hearing it became apparent that the parties to the proceeding had differing views as to what costs should be excluded as well as what was to be considered an OSS function. Hence, we agreed to allow BellSouth's testimony that included costs for manual ordering to be introduced into evidence. We reasoned that in allowing this testimony, we would provide the parties the opportunity to cross-examine responsive witnesses and then to brief the issue as to what costs should be included related to legacy systems, and what costs should not be included, in these proceedings.

WorldCom argues that despite our order, BellSouth includes in its study costs associated with the LCSC order taking function. It further argues that the LCSC is a manual OSS function that is set up as an alternative to the electronic system. We agree. As witness Varner states, the LCSC is utilized by the CLECs for the purpose of ordering. The costs associated with the LCSC include the time spent on the phone with the CLEC taking down the information that the CLEC has requested, preparing an order and sending it downstream for processing. WorldCom states that the specific OSS costs to be removed have been identified by BellSouth witness Caldwell.

MCI argues that the LCSC activities are inappropriate in light of the FCC's requirement that electronic interfaces be available by January 1, 1997. As a result, MCI asserts that BellSouth should be

required to exclude all unnecessary manual costs associated with service ordering, including the LCSC.

AT&T and BellSouth do not argue about what costs are to be associated with manual ordering. However, BellSouth witness Varner did assert at hearing that BellSouth proposes a non-recurring price that includes the cost of the LCSC if a CLEC places an order manually, and a different price if a CLEC places an order electronically. Only LCSC costs associated with fallout are included in BellSouth's proposed electronic ordering charge, according to witness Caldwell.

BellSouth's proposed prices for electronic ordering are lower than those for manual ordering. However, witness Varner asserts that there is an additional element that is needed if an order is placed electronically. He contends that it is this additional element, $10.99, that was excluded from these proceedings, not the non-recurring electronic and manual ordering charges. Furthermore, witness Varner states that the LCSC is not an OSS function, but is a center with people in it who answer the telephone and take orders. Moreover, he maintains that the non-recurring charges associated with a UNE should include the cost of ordering the UNE, and, therefore, should be included in the non-recurring charge.

We recognize that OSS costs, manual and electronic, may be recoverable costs incurred by BellSouth. We did not, however, contemplate in Order PSC-96-1579-FOF-TP that BellSouth would file cost studies including OSS costs in these proceedings other than for its legacy systems. We stated in Order PSC-98-0123-PCO-TP that, as it pertains to OSSs, only testimony regarding BellSouth's proposal to recover costs associated with its legacy systems shall be retained in the record for these proceedings.

Upon consideration, we find that BellSouth's LCSC costs are a component of its OSSs and therefore they must be excluded from recovery in these proceedings. Indeed, all ordering charges, manual or electronic, shall be excluded from the non-recurring rates in these proceedings.

We are cognizant that if ordering costs are excluded from the UNE rates set in these proceedings, a CLEC may be stymied in placing UNE orders. Thus, we strongly encourage the parties to negotiate in good faith to establish rates for OSS functions. If, however, the companies are unable to reach agreement through such negotiations, they may of course seek our guidance.

V. CONCLUSION

We have conducted these proceedings pursuant to the directives and criteria of Sections 251 and 252 of the Act. We believe that our decisions are consistent with the terms of Section 251, the provisions of the FCC's implementing Rules that have not been vacated, and the applicable provisions of Chapter 364, Florida Statutes.

Based on the foregoing, it is therefore

ORDERED by the Florida Public Service Commission that the specific findings set forth in this Order are approved in every respect. It is further

ORDERED that the analyses and adjustments for cost of capital, depreciation, taxes, shared and common costs, the residual recovery requirement, and disconnect costs set forth in Part III of this Order are approved. It is further

ORDERED that the recurring and non-recurring charges for the network interface device, 2-wire and 4-wire loop distribution, 2 wire ADSL-compatible loop, 2-wire and 4-wire HDSL-compatible loop, physical collocation, virtual collocation, directory assistance, dedicated transport and 4-wire analog port are approved as set forth in Part IV of this Order. It is further

ORDERED that BellSouth Telecommunications, Inc.'s Local Carrier Service Center costs are excluded from recovery in this proceeding in accordance with Order No. PSC-98-0123-PCO-TP. It is further

ORDERED that the parties shall submit written agreements memorializing and implementing our decisions herein within thirty (30) days of the issuance of this Order. It is further

ORDERED that the agreements shall be submitted for approval in accordance with Section 252(e)(2)(b) of the Telecommunications Act of 1996. It is further

ORDERED that these dockets shall remain open pending approval of the agreements submitted in compliance with this Order.

By ORDER of the Florida Public Service Commission this 29th day of April, 1998.

BLANCA S. BAYÓ, Director
Division of Records and Reporting

By: Kay Flynn
Kay Flynn, Chief
Bureau of Records

(S E A L)

CJP/BK

DISSENT

Commissioner Deason dissents from the decision in this Order regarding the recovery of all shared and common costs through recurring charges.

NOTICE OF FURTHER PROCEEDINGS OR JUDICIAL REVIEW

The Florida Public Service Commission is required by Section 120.569(1), Florida Statutes, to notify parties of any administrative hearing or judicial review of Commission orders that is available under Sections 120.57 or 120.68, Florida Statutes, as well as the procedures and time limits that apply. This notice should not be construed to mean all requests for an administrative hearing or judicial review will be granted or result in the relief sought.

Any party adversely affected by the Commission's final action in this matter may request: 1) reconsideration of the decision by filing a motion for reconsideration with the Director, Division of Records and Reporting, 2540 Shumard Oak Boulevard, Tallahassee, Florida 32399-0850, within fifteen (15) days of the issuance of this order in the form prescribed by Rule 25-22.060, Florida Administrative Code; or 2) judicial review in Federal district court pursuant to the Federal Telecommunications Act of 1996, 47 U.S.C. § 252(e)(6).