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November 27, 1995

**ORIGINAL
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Mrs. Blanca S. Bayo
Director, Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399

RE: Docket No. 950984A-TP and Docket No. 950984B-TP

Dear Mrs. Bayo:

Enclosed please find in response to Metropolitan Fiber Systems of Florida, Inc. and MCImetro's Petitions an original and fifteen copies of BellSouth Telecommunications, Inc.'s Direct Testimony of Dr. Aniruddha (Andy) Banerjee and Robert C. Schey in the captioned dockets.

A copy of this letter is enclosed. Please mark it to indicate that the original was filed and return the copy to me. Copies have been served on the parties shown on the attached Certificate of Service.

Sincerely,

Nancy B. White (SL)

Nancy B. White

ACK

AFA

APP Enclosures

CAF cc: All Parties of Record

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CTR R. G. Beatty

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Docket No. 950984A-TP

Docket No. 950984B-TP

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1

2

DIRECT TESTIMONY OF ANIRUDDHA (ANDY) BANERJEE

3

ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

4

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

5

DOCKET NO. 950984A-TP (MFS-FL PETITION),

6

AND 950984B-TP (MCIMETRO PETITION)

7

NOVEMBER 27, 1995

8

9

10

11 Q. Please state your name, address, and place of
12 employment.

13

14 A. My name is Aniruddha (Andy) Banerjee. I am a
15 Senior Consultant with National Economic Research
16 Associates, Inc., located at One Main Street,
17 Cambridge, MA 02142.

18

19 Q. Please give a brief description of your background
20 and experience.

21

22 A. I earned a Bachelor of Arts (with Honors) and a
23 Master of Arts degree in Economics from the
24 University of Delhi, India, in 1975 and 1977
25 respectively. I received a Ph.D. in Agricultural

1 Economics from the Pennsylvania State University in
2 1985. I have over eight years of experience
3 teaching undergraduate and graduate courses in
4 various fields of Economics, and have conducted
5 academic research that has led to publications and
6 conference presentations.

7
8 Since 1988, I have held various positions in the
9 telecommunications industry. Prior to my present
10 position, I have been an economist in the Market
11 Analysis & Forecasting Division at AT&T
12 Communications in Bedminster, NJ, a Member of
13 Technical Staff at Bell Communications Research in
14 Livingston, NJ, and a Research Economist at
15 BellSouth Telecommunications in Birmingham, AL. In
16 these positions, I was responsible for conducting
17 economic and market analysis, building quantitative
18 demand models for telecommunication services,
19 developing economic positions and strategies, and
20 providing expert testimony support on regulatory
21 economic matters. In my present capacity, I
22 provide quantitative and policy analysis for
23 telecommunications industry clients principally on
24 matters of concern to local exchange carriers. My
25 curriculum vitae is attached to this testimony as

1 Exhibit AXB-1.

2

3 Q. Have you previously filed testimony before this
4 Commission?

5

6 A. Yes. I filed direct and rebuttal testimony on
7 behalf of BellSouth Telecommunications, Inc., in
8 Docket 950985-TP (in response to Petition by the
9 Teleport Communications Group) on September 15 and
10 September 29, respectively.

11

12 Q. Please state the purpose of your direct testimony.

13

14 A. This testimony responds to some of the economic
15 issues raised in their testimonies in this Docket
16 by Dr. Nina W. Cornell for MCI Metro Access
17 Transmission Services, Inc. (MCImetro) in Docket
18 No. 950984A-TP and by Mr. Timothy T. Devine for
19 Metropolitan Fiber Systems of Florida, Inc.
20 (MFS-FL) in Docket No. 950984B-TP. In particular,
21 it addresses their prescriptions for the pricing of
22 unbundled network services by BellSouth. [Issue #
23 3]

24

25 Q. What do these parties propose for the pricing of

1 BellSouth's unbundled services like links and
2 ports?

3

4 A. Dr. Cornell [at 7] recommends that the prices of
5 unbundled elements should be set at their
6 respective total service long run incremental cost
7 (TSLRIC). In contrast, Mr. Devine [at 23] proposes
8 to set prices of unbundled elements at their
9 respective long run incremental cost (LRIC). Both
10 claim that their cost measure (TSLRIC or LRIC) is
11 the "direct economic cost" of a facility or
12 service.

13

14 Q. Please explain the difference between the two cost
15 measures, TSLRIC and LRIC.

16

17 A. LRIC measures the additional long run cost that is
18 generated whenever an incremental quantity of a
19 service is produced. The increment in question can
20 be the next unit (e.g., the next "minute of use" or
21 next call) or a number of units. When the
22 increment is only the next unit of a service, LRIC
23 is also called the long run marginal cost. LRIC
24 depends only on the new increment of service that
25 needs to be produced; it bears no relationship to

1 the units of service that may have been produced in
2 the past.

3

4 TSLRIC measures the long run cost of producing a
5 service when the increment in question is the
6 entire volume of that service (i.e. not just the
7 "next" unit of service unless that next unit is all
8 that is produced). Since TSLRIC is the cost of the
9 whole service, it includes not only the costs that
10 vary with the number of units produced but also the
11 service-specific fixed costs without which the
12 service could not be produced in the first place.

13

14 LRIC and TSLRIC differ in the following respects.
15 First, TSLRIC accounts for the cost of producing a
16 service from scratch whereas LRIC does not (except
17 when the "next" unit produced is the very first
18 unit of the service). Second, LRIC excludes
19 service-specific fixed costs while TSLRIC includes
20 them. The only exception to this rule arises for
21 the very first unit of the service, when the TSLRIC
22 and the LRIC coincide.

23

24 Q. What are the economically proper uses of LRIC and
25 TSLRIC?

1
2 A. The economically proper use of LRIC is as a price
3 floor, i.e. the lowest level to which the price can
4 fall without violating economic efficiency rules.
5 In fact, in perfectly competitive unregulated
6 markets and in the absence of economies of scale
7 and/or scope, a price equal to LRIC or marginal
8 cost is economically efficient. However, when
9 regulation or market constraints apply or the firm
10 (like BellSouth) experiences economies of scale and
11 scope (the latter due to substantial shared and
12 common costs), services priced exactly at LRIC will
13 fail to recover all the costs of the firm.
14 Therefore, economic efficiency in this
15 "second-best" world requires that all service
16 prices be marked up above their respective LRICs in
17 order that all the common and shared costs also be
18 recovered. There are various ways to mark up those
19 prices; an economically efficient (least
20 welfare-distorting) way to do so is to mark up the
21 price of a service in inverse proportion to its
22 price elasticity of demand. Thus, the least
23 price-elastic services are marked up most and the
24 most price-elastic services are marked up least.
25

1 The economically proper use of TSLRIC is as a test
2 for cross-subsidy. Since, to remain viable in the
3 long run, a firm's total revenues must cover its
4 total costs, the TSLRIC can be used to detect
5 cross-subsidies as follows. Suppose there are two
6 services X and Y. The customers of service X would
7 be said to be subsidizing the customers of service
8 Y if Y's revenue fell short of its cost but X's
9 revenue exceeded its cost by enough so that the
10 combined revenue from X and Y was at least equal to
11 the combined cost of X and Y. This test can be
12 operationalized by requiring that all services
13 produced by a firm generate enough revenues to
14 cover their respective TSLRICs. Failure of even
15 one service to do so would mean that it would have
16 to be cross-subsidized by the other service(s)
17 before the firm could break even.

18
19 It is not economically proper to use the TSLRIC as
20 a price floor. The firm should have the ability
21 and flexibility to charge for the next unit it
22 produces only as much as it costs it to produce
23 that unit. As long as, at the overall level of
24 that service, the firm is earning enough to cover
25 the TSLRIC of that service, it should not be

1 constrained from pricing on the basis of LRIC
2 alone.

3

4 Q. What is your opinion of the pricing prescriptions
5 advanced by Dr. Cornell and Mr. Devine?

6

7 A. Dr. Cornell's prescription of the TSLRIC clearly
8 violates its economically proper use. Mr. Devine's
9 prescription - based on the
10 LRIC - is closer to the economically proper pricing
11 principle. However, by insisting that unbundled
12 elements be priced at LRIC, he fails to recognize
13 that (a) LRIC is only a price floor, and (b)
14 BellSouth should have the latitude to add
15 contribution to its service LRICs in order to
16 recover its substantial shared and common costs.
17 Otherwise, BellSouth cannot remain a viable firm.

18

19 Q. What is the concern of these parties with including
20 contribution in the prices of unbundled elements?

21

22 A. Dr. Cornell's main concern [at 7] is that "...a
23 price for loops that was greater than TSLRIC would
24 create a price squeeze for entrants." Mr. Devine
25 appears to be reflecting the same concern when he

1 argues [at 23] that "... (LRIC) should serve as the
2 target price and cap for unbundled loops where such
3 loops must be employed by competitive carriers to
4 compete realistically and practically with the
5 entrenched monopoly service provider, BellSouth."

6

7 Q. Is their concern with price squeeze justified?

8

9 A. No, not if economically correct imputation
10 procedures are adopted. The price squeeze can only
11 occur when the monopoly provider of an essential
12 wholesale facility or service is also a retail
13 competitor of firms it is supplying the wholesale
14 service to, and the wholesale service is a
15 necessary ingredient of the retail service. For
16 example, if loops are available only from BellSouth
17 but alternative local exchange carriers (ALECs)
18 need access to those loops (and their customers) in
19 order to sell competitive retail local services, a
20 price squeeze of the type described by Dr. Cornell
21 [at 7] could, in principle, occur. However, a
22 simple device for preventing such a squeeze is to
23 require the provider of the unbundled elements to
24 impute the contributions raised from those elements
25 into the prices of their competitive retail local

1 services. This would ensure that retail
2 competition can go forward on the basis of the
3 relative efficiencies of the competing firms, not
4 on the basis of any unfair advantage available to
5 the provider of the essential facility.

6

7 Q. Couldn't the contributions needed by BellSouth (or
8 any incumbent (LEC) to pay for its "indirect" (i.e.
9 shared and common) costs be raised from its retail
10 services? Why should wholesale services like
11 unbundled loops or ports be required to contribute
12 as well?

13

14 A. The LEC should have the opportunity and the
15 flexibility to raise the requisite contributions
16 from any and all of its services. Faced with
17 varying degrees of competition for its different
18 services, it should not be compelled or locked into
19 restrictive formulas or means for raising the
20 contribution. Economic theory prescribes that the
21 amount of contribution raised from a service should
22 vary inversely with its price elasticity of demand.
23 If this formula could be applied to all of the LECs
24 services -- wholesale or retail -- the loss of
25 economic efficiency and social welfare that results

1 from pricing above LRIC would be minimized. From
2 society's standpoint, therefore, the proper
3 approach is to raise contributions from wholesale
4 unbundled elements as well, in inverse proportion
5 to their market price elasticities.

6

7 Q. Mr. Devine [at 24] proposes that the LRIC
8 methodology only be adopted if (a) the sum of the
9 prices of the unbundled elements is no greater than
10 the price of the bundled service, and (b) the
11 price-LRIC ratio for each element and for the
12 bundled service is the same. Is this proposal
13 sound on economic grounds?

14

15 A. Absolutely not. This proposal clearly violates the
16 economically sound pricing principles I have
17 outlined in this testimony.

18

19 First, requiring that the LECs price of its bundled
20 service not be allowed (by use of regulatory
21 dictate, no doubt) to be below the summed prices of
22 its unbundled parts is only proper when the
23 underlying technology or cost structure is linear
24 or "additive". There are many circumstances when a
25 multiproduct firm can produce two products cheaper

1 when their production is combined than when it is
2 separated. This happens because the costs that are
3 common to or shared between the different outputs
4 need to be incurred only once when production is
5 combined. If, in the process of bundling, the LEC
6 can achieve these economies relative to providing
7 the piece parts on a standalone basis, then those
8 economies (of "scope") should be made available to
9 consumers in the form of lower prices. In this
10 context, Mr. Devine's prescription -- cloaked in
11 the language of non-discrimination and fairness --
12 should be seen as no more than what it is: an
13 effort to secure a competitive advantage for the
14 ALEC at the expense of the customer or ratepayer.
15 The Commission's prime concern being for the
16 welfare of Florida customers, Mr. Devine's proposal
17 cannot be considered as being anything other than
18 self-serving.

19

20 Second, the requirement that the price-LRIC ratio
21 be equalized across all unbundled parts and the
22 bundled service violates the economically efficient
23 pricing principle that I stated before. If, as Mr.
24 Devine also suggests, the price should be set equal
25 to the LRIC, then this requirement would be

1 trivially true. However, if that ratio is set in
2 accordance with each service's price elasticity of
3 demand, the loss of economic efficiency or social
4 welfare that would occur from setting price above
5 LRIC would be minimized. Again, there is
6 absolutely no economic justification for Mr.
7 Devine's bizarre prescription of equalized
8 price-LRIC ratios.

9

10 Q. Does this conclude your testimony?

11

12 A. Yes.

13

14

15

16

17

18

19

20

21

22

23

24

25

ANIRUDDHA (ANDY) BANERJEE

BUSINESS ADDRESS

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Dr. Aniruddha (Andy) Banerjee is a Senior Consultant at NERA. He is responsible for providing analysis of and testimony on regulatory and economic issues of concern to telecommunications companies, preparing and responding to interrogatories in regulatory proceedings, and conducting econometric/statistical analysis to support marketing and market research activities of telecommunications companies. His market research activities are carried out, as needed, in collaboration with leading providers of telecommunications data or directly with telecommunications companies.

Before coming to NERA, Dr. Banerjee was a Research Economist at BellSouth Telecommunications where he was responsible for providing economic policy guidelines to key decision-makers and the Officer Body, preparing testimony and cross-examination questions, responding to interrogatories, and building econometric models to answer business questions. He provided quantification support on BellSouth's design of a price cap regulatory framework, and contributed to BellSouth's policies on local and toll imputation, universal service, interconnection pricing, rate rebalancing, and per use pricing of vertical services. He also represented BellSouth's participation in the National Telecommunications Demand Study, an ongoing study of demand trends in the telecommunications industry.

Prior to BellSouth, Dr. Banerjee was a Member of the Technical Staff at Bell Communications Research and a Staff Supervisor at AT&T. Dr. Banerjee has several years of experience teaching graduate and undergraduate courses in economic theory, statistics, econometrics, industrial organization, and public finance. He has conducted research on the dynamics of futures markets and various aspects of time series econometrics. He has presented a number of papers on telecommunications economics issues at national business and academic conferences.

EDUCATION

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Ph. D., *Agricultural Economics*, 1985

UNIVERSITY OF DELHI, INDIA
M.A., Economics, 1977

UNIVERSITY OF DELHI, INDIA
B.A., Economics (Honors), 1975

EMPLOYMENT

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC.

1995- Senior Consultant, Communications Practice. Responsible for applying economic theory, regulatory economics, and econometric analysis to a variety of tasks: supporting telecommunications firms in litigation and regulatory matters, market research, and strategic planning.

BELLSOUTH TELECOMMUNICATIONS

1992-1995 Research Economist, Statistics and Econometrics Group. Developed, led, and disseminated economic and econometric research on issues of concern to BellSouth Telecommunications in particular and the telecommunications industry in general. Contributed to each of the following areas: regulatory economics, demand analysis (growth and elasticities), market potential, diffusion, pricing, cost, new product planning, forecasting, market research, competitive analysis, and the development of strategy/policy positions for BellSouth. Supervised and collaborated with other BellSouth economists and strategic planners and outside consultants.

BELL COMMUNICATIONS RESEARCH

1989-1992 Member of Technical Staff, Regulatory Economics and Pricing Theory, Demand Response Analysis Group. Developed various statistical and econometric methods and models that are applicable to the study of demand for various types of telephone service. The focus was on analysis, forecasting, and rate design support to client companies including BellSouth, U S West, NYNEX, and Bell Atlantic. Developed software for demand and market potential analysis using advanced mathematical/statistical languages. Transformed original techniques research into business tools for analysts within client companies.

AT&T COMMUNICATIONS

1988-1989 Staff Supervisor, Market Analysis and Forecasting, Consumer Markets and Services. Assisted and contributed to demand analysis and forecasting efforts of the group. The focus was on demand issues related to AT&T's business and residential long distance telephone services.

THE PENNSYLVANIA STATE UNIVERSITY

1985-1988 Assistant Professor, Department of Economics. Developed and taught undergraduate and graduate courses in economics and econometrics. Conducted personal research in economics and econometrics. Supervised graduate student research leading to M.S. and Ph.D. degrees in economics. Developed the econometrics component of a new graduate program in policy analysis at Penn State. And, advised undergraduate economics students on their curriculum and course selection. Taught courses on introductory macro-economic theory, introductory and intermediate micro-economic theory, industrial organization, public sector economics, statistics, and introductory econometrics. Developed and taught advanced graduate econometrics and time series courses (frequency-domain econometrics and spectral analysis, dynamic simultaneous equations systems and state space models, causality, model testing and validation, nonlinear time series, and asymptotic theory.

1982-1985 Instructor, Department of Economics. Taught a number of undergraduate economics courses including macro-economic theory, micro-economic theory, public sector economics, and statistical foundations of econometrics.

1979-1982 Research Assistant, Department of Agricultural Economics & Rural Sociology. Assisted in research activities of Professor Robert D. Weaver of the Department of Agricultural Economics. Research areas included: stabilization of prices of internationally traded agricultural commodities; choice under risk-aversion by a firm faced with multiple sources of uncertainty; impacts of public policy on risk-averse firms; market efficiency, role of information, distribution of asset returns, and market equilibrium; and productivity and cost relations in the wheat, corn, and soybean producing areas of the U.S. using crop survey data from the U.S. Department of Agriculture. Most of the work consisted of literature research, writing computer programming, and econometric data analysis.

UNIVERSITY OF DELHI, INDIA

1977-1979 Lecturer, Department of Economics, Shri Ram College of Commerce. Taught undergraduate economics courses including micro-economic theory, public finance, and economic planning and policy.

HONORS AND AWARDS

Phi Kappa Phi, inducted 1982

Gamma Sigma Delta Honor Society of Agriculture, inducted 1983

Marquis' Who's Who in the South and Southwest, 1995-96

Department Head Award, BellSouth Telecommunications, 1993

Department Head Commendation, Bell Communications Research, 1992

Vice President's Award, Bell Communications Research, 1990

AFFILIATIONS

American Marketing Association

National Association of Business Economists

PAPERS AND PUBLICATIONS

CONTRIBUTIONS TO NERA REPORTS

"Economies of Scope in Telecommunications," for Bell Canada, 1995.

"Economic Welfare Benefits from Rate Rebalancing," for Stentor Resource Centre Inc., 1995.

"Telephone Company Provision of Broadband Services: Economies of Scope, Competition, and Public Policy," for BellSouth Interactive Media Services

TESTIMONY

Direct Testimony addressing interconnection rate structure design, on behalf of BellSouth Telecommunications, to Florida Public Service Commission, Docket 950985-TP, September 1995.

Rebuttal Testimony critiquing bill and keep compensation for interconnection, on behalf of BellSouth Telecommunications, to Florida Public Service Commission, Docket 950985-TP, September 1995.

Wrote significant sections of testimony presented to regulatory commissions on price cap and local competition (Vermont, Louisiana) and universal service issues (Louisiana, Tennessee)

TELECOMMUNICATIONS-RELATED PAPERS

"The Case Against Imputation of Access Charges in IntraLATA Toll Prices: Economic Efficiency and Fairness Reconsidered," BellSouth Telecommunications, 1994.

"Pricing of Local Exchange Interconnection Service From the Perspective of Economic Theory," BellSouth Telecommunications, 1993.

"Economies of Scale and Scope, Subadditivity of Costs, and Natural Monopoly Tests for Regulated Utilities," BellSouth Telecommunications, 1993.

"Fairness and Economic Efficiency in Regulation: Imputation v. Equal Contributions in IntraLATA Toll Pricing," Report to the Task Force on Imputation of Access Charges in IntraLATA Toll Price, BellSouth Telecommunications, 1993.

"Economic Analysis of Efficient versus Imputation-Based Pricing by a Regulated Public Utility," Report to the Task Force on Imputation of Access Charges in IntraLATA Toll Price, BellSouth Telecommunications, 1993.

"E: A Maximum Likelihood Estimation Program, A User's Guide to Some Applications," Bell Communications Research, 1992.

"Error Components Panel Data Modeling of Share Equation Systems: An Application to Telecommunications Access Demand," Bell Communications Research, 1989.

"Analysis of Demand Migration and Take Rates for Special Access High Capacity Services," Bell Communications Research, 1990.

"Business Outbound Service System: An Empirical Modeling Framework," AT&T, 1989.

MISCELLANEOUS PAPERS

"Does Futures Trading Destabilize Cash Prices? Evidence for U.S. Live Beef Cattle," (with R.D. Weaver), Journal of Futures Markets, Vol 10(1), 1990, (pp. 41-60).

"Market Structure and the Dynamics of Retail Food Prices," (with R.D. Weaver and P. Chattin), Northeastern Journal of Agricultural and Resource Economics, Vol 18(2), 1989, (pp. 160-170).

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"Optimal Interpolation and Distribution of Time Series by Related Series Using a Spectral Estimator for the Residual Variance," Bell Communications Research, 1990.

"Size and Power Characteristics of Three Tests of Nonlinearity in Time Series," AT&T, 1989.

"Model Testing and Selection in Applied Econometrics," AT&T, 1989.

RECENT CONFERENCE PRESENTATIONS

"On Modelling the Dynamics of Demand for Optional and New Services," International Communications Forecasting Conference, Toronto, Canada, June 13-16, 1995.

"The Case Against Imputation of Access Charges in IntraLATA Toll Prices: Economic Efficiency and Fairness Reconsidered," Rutgers University Advanced Workshop in Regulation and Public Utility Economics, Seventh Annual Western Conference, San Diego, CA, July 6-8, 1994.

"Future Directions in Modeling the Demand for Vertical Services," National Telecommunications Demand Study Conference, La Jolla, CA, March 24-25, 1994.

"E: A Maximum Likelihood Estimation Program," National Telecommunications Forecasting Conference, Crystal City, VA, June 1-4, 1993.

Discussant of "The National Telecommunications Demand Study," National Regulatory Research Conference on Telecommunications Demand, Denver, CO, August 3-5, 1992.

"Using Demographics to Predict New Service Take Rates: Discrete Choice Analysis vs. Categorical Data Analysis," National Telecommunications Forecasting Conference, Atlanta, GA, May 5-8, 1992.

"Price Cap Regulations for the LECs: Implications for Demand and Revenue Forecasting," National Telecommunications Forecasting Conference, Boston, MA, May 30, 1991.

"Demand Migration for Special Access High Capacity Services," Rutgers University Advanced Workshop in Regulation and Public Utility Economics, Third Annual Western Conference, San Diego, CA, July 11-13, 1990.

"Error Components Panel Data Modeling of Telecommunications Access Demand," Bellcore-Bell Canada Telecommunications Demand Analysis Conference, Hilton Head, SC, April 22-25, 1990, and Bell Atlantic Business Research Conference, Baltimore, MD, October 24-27, 1989.

"Analysis of Integrated Demand Systems," Rutgers University Advanced Workshop in Regulation and Public Utility Economics, Second Annual Western Conference, Monterey, CA, July 5-7, 1989.

Panel Discussion on "The Regulatory and Operational Impacts of Price Caps," National Telecommunications Forecasting Conference, San Francisco, CA, May, 1989.