

ORIGINAL

Intermedia EXHIBIT _____

Revised Testimony
of Marvin H. Kahn

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Intermedia Communications,)
Inc. for Arbitration with BellSouth)
Telecommunications, Inc., pursuant to the) Docket No. 981642-TP
Telecommunications Act of 1996)

REVISED DIRECT TESTIMONY OF DR. MARVIN H. KAHN

ON BEHALF OF
INTERMEDIA COMMUNICATIONS, INC.

FEBRUARY 4, 1999

EXETER

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I. QUALIFICATIONS AND PURPOSE

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Marvin H. Kahn. I am a Senior Economist and a founding principal of
3 Exeter Associates, Inc. My office is located at 12510 Prosperity Drive, Silver Spring,
4 Maryland 20904.

5 **Q. PLEASE REVIEW YOUR BACKGROUND AND QUALIFICATIONS.**

6 A. I am an economist specializing in public utility regulation, communications, energy, and
7 antitrust analysis. My primary research interest is in the application of microeconomic
8 principles to public policy issues in these areas. Over the last several years, my focus has
9 turned to matters regarding the restructuring of the natural gas pipeline, electric and
10 telephone industries and the regulation of firms in these industries operating
11 simultaneously in competitive and non-competitive markets. Particular issues addressed
12 include unbundling services, TELRIC analyses, the effects of imposing line of business
13 restrictions on regulated firms, assessments of alternative regulatory structures, and
14 matters regarding cost allocation and rate design.

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1 In addition to my consulting experiences, I taught economics or lectured at the
2 University of Tennessee, the University of Missouri in St. Louis, Washington University
3 in St. Louis, at Merrimac College and at The Johns Hopkins University. I served as a
4 senior economist with the Institute of Defense Analysis and the MILRE Corporation, both
5 not-for-profit Federal Contract Research Centers in the Washington, D.C. metropolitan
6 area. I also served as a senior staff economist with an Ad Hoc Committee of the U.S.
7 House Committee on Currency and Banking, focusing on energy and employment issues.

8 I am a graduate of Ohio Northern University and hold a Ph.D. in Economics from
9 Washington University in St. Louis. Further details of my experience and a complete list
10 of testimonies is included as my Exhibit__ (MHK-1).

11 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

12 A. My testimony is organized in six sections, including this initial introductory section. In
13 Section II, I discuss the economic principles of pricing and open access. Specifically, I
14 explain why pricing at economic or forward-looking cost is critical to achieving
15 competitive benefits established as the goal of the Act. I also explain why the TSLRIC
16 costing and pricing methodology adopted by the Commission should be applied to all
17 interconnection services and unbundled network elements. No distinction in pricing
18 various interconnection arrangements and UNEs is appropriate if widespread consumer
19 benefits remain the goal of the telecommunications policy. I note and describe why
20 requiring that all components of the ILEC network be made available in the form of
21 unbundled network elements and through interconnection is consistent with the
22 underlying premise and goals of the Act. Doing so would result in CLECs having access

1 to HICAP loops, and interoffice transport, as well as to data (i.e., advanced
2 **communications services** such as packet switching) and other network elements on an
3 unbundled basis and at rates based on economic cost. Finally, I explain why pricing
4 parity (imputation) is necessary to avoid price discrimination and price squeeze, as well
5 as to provide widespread consumer benefits to telecommunications customers.

6 In Section III, I discuss issues particular to non-recurring charges. I explain why
7 careful attention must be paid to cost development for these charges, in part because this
8 is an area of costing that is both new and different. In the years since passage of the Act,
9 ILECs, CLECs and commissions have gained considerable knowledge and experience in
10 estimating forward-looking cost of non-recurring activities. Recognition of this suggests
11 that these cost and rates should be reviewed and adjustments made as new information is
12 gained. I also explain why TELRIC pricing and price ceilings based on charges to
13 BellSouth's end use customers for comparable activities are appropriate.

14 Section IV deals with collocation. The Commission has established rates for a
15 number of collocation activities in its recent generic cost proceeding. There are a number
16 of aspects of collocation that can act as a barrier to entry. I explain why the Commission
17 should require the establishment of alternatives which will reduce the time involved and
18 will allow CLECs and ILECs to minimize the costs involved with interconnection. This
19 would include optional, space-saving forms of collocation, such as cageless collocation
20 and cage sharing, and alternatives to a collocation requirement, such as through the
21 extended loop.

1 Section V deals with Frame Relay costs and related issues. In this section, I discuss
2 the appropriateness of TELRIC based costs for unbundled network elements associated
3 with packet switching functions and services. In Section VI, I discuss the appropriate
4 costing methodology for call termination.

5 Finally, Section VII deals with several remaining issues related to unbundled
6 network elements, interconnection and pricing issues. For example, I discuss the
7 appropriateness of establishing unbundled network elements associated with xDSL
8 functions, packet switching functions and geographic deaveraging. In many instances, the
9 information necessary to actually identify the appropriate TELRIC has not been made
10 available by BellSouth. In such circumstances, the information will be sought during
11 discovery and estimates will be provided to the Commission upon review and
12 examination of those data.

13 In many instances, the information necessary to actually identify the appropriate
14 TELRIC has not yet been made available by BellSouth. In such circumstances, the
15 information is being sought during discovery and estimates will be provided to the
16 Commission upon review and examination of those data. It is my understanding that
17 BellSouth plans to submit a new set of cost studies sometime on or shortly after February
18 4, 1999. I will review and comment on those studies as they become available.

19
20 **II. COSTING AND PRICING PRINCIPLES**

21 **A. OVERVIEW**

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1 Q. **WHAT ECONOMIC POLICY OBJECTIVES SHOULD GOVERN THE**
2 **ESTABLISHMENT OF PRICES, TERMS AND CONDITIONS FOR**
3 **INTERCONNECTION ARRANGEMENTS AND NETWORK ELEMENTS?**

4 A. The 1996 Act expressed the view that the national telecommunications' policy goals
5 could be better met through the workings of a competitive market than through a
6 regulated monopoly. The intent of the Act is that consumers benefit from an increase in
7 competitive activity through lower retail prices and a diversity of high quality, advanced
8 service options. This position is articulated in the preamble to the Act:

9 **To promote competition and reduce regulation in order to secure**
10 **lower prices and higher quality service for American**
11 **telecommunications consumers and encourage the rapid deployment**
12 **of new technology.**
13

14 Thus, the primary economic policy objective of the Act can be simply described as
15 attaining a "competitive outcome."

16 The Act established a vehicle to allow meaningful and effective competition to
17 develop in the markets for local exchange services. That vehicle is based on free and
18 unfettered entry into the market for local services. This requires that the market be free of
19 barriers to entry, which in turn, requires the availability of network resources (which
20 incorporates unbundling to the extent needed by CLECs) and the appropriate pricing of
21 these resources (which includes imputation requirements for non-discrimination). The
22 pricing of unbundled network elements is one of the critical components of any open
23 market policy implementing the new Sections 251(c)(3) and 252(d)(1) of the Act. Since
24 the market is not now competitive, regulatory oversight remains necessary to achieve this
25 outcome. A key policy objective for the Commission should be to establish prices for all

1 interconnection and network elements that are consistent with and support a competitive
2 market outcome. That result can only be achieved through a pricing policy which
3 includes prices based on economic cost and which prevents discrimination.

4 **Q. WHAT ARE THE EFFICIENCY IMPLICATIONS ASSOCIATED WITH**
5 **THE COMPETITIVE MARKET OUTCOME?**

6 A. In a competitive market, characterized by a sufficient number of buyers and sellers so that
7 no one market participant can dictate the price or quantity available, the market yields
8 important efficiencies. These efficiencies fall into two categories: operational and
9 allocative efficiencies.

10 Operational efficiency results when the lowest cost method of production is utilized
11 to produce the good or service in question. Market competition promotes this result. For
12 instance, new entrants into the market are not required to adopt the same operating
13 methods or technologies used by the incumbent. Instead, they are able to adopt the lowest
14 cost method of production. With their lower costs, these firms will tend to lower the
15 price charged in order to gain market share from higher-cost incumbents. Other market
16 participants are then forced to reduce their prices, or face the loss of market share. As
17 new entrants increase supply, inefficient producers are forced to either become more
18 efficient or lose market share or possibly cease production altogether. The result is lower
19 industry costs and lower prices to consumers.

20 Allocative efficiency results when resources are channeled into the production of
21 those goods and services that are valued more highly than the resources necessary for
22 production. As long as the market price covers the cost to produce an additional unit of

1 output, that unit of output would be produced in a competitive market. Since society has
2 scarce resources, it is in society's interest to have these resources used in a way that
3 maximizes the value to consumers of what is produced with those limited resources.

4 **Q. WHAT ROLE DOES PRICING PLAY IN ACHIEVING THESE RESULTS**
5 **AND THE OBJECTIVES OF THE ACT?**

6 **A.** Pricing sends signals to buyers and sellers and affects the decisions of both. In a most
7 general sense, pricing plays two roles: cost compensation and rationing of limited
8 quantities.¹

9 Sellers turn to price signals to make decisions with regard to market entry and
10 production alternatives. By comparing prices to their own costs, producers determine
11 which markets and services are profitable, and thus make entry (or exit) decisions. In
12 addition, price signals are important inputs into "make-buy" decisions. That is, these
13 signals are key in determining whether entry will be "facilities based," using the CLECs
14 own facilities with or without UNEs, or whether entry will instead involve resale.

15 Price signals are used by buyers to select among alternative goods and services, and
16 among alternative service providers. Since both producers and buyers react to pricing,
17 the greatest opportunity to realize the allocative and operational efficiencies discussed
18 above exists if prices reflect the underlying cost. Thus, to promote the competitive
19 outcome, prices should be cost based. With cost based prices, the most efficient
20 producers are rewarded and are ensured adequate compensation for the goods and

¹For a more general discussion of the role of prices in the regulated model, see Bonbright, Principles of Public Utility Rates, Columbia (1961), Chapter VI.

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1 services produced. At the same time, consumers are asked to pay the full additional cost
2 of the resources used to produce the additional output. By sending efficient price signals,
3 prices that are cost-based and non-discriminatory promote the goals of the Act.

4 **B. TELRIC**

5 **Q. WHAT IS THE APPROPRIATE METHODOLOGY FOR DEVELOPING**
6 **RATES FOR INTERCONNECTION AND UNBUNDLED ELEMENTS?**

7 A. Decisions in a competitive market are made based on forward-looking costs, not historic
8 costs. Thus, the appropriate cost methodology to be used in conjunction with a policy
9 intending to promote efficient pricing, efficient production and the competitive outcome
10 is one which focuses on economic, forward-looking costs. The TELRIC/TSLRIC
11 methodology which has been adopted by the FCC and relied upon by this Commission in
12 setting prices for interconnection and network elements is such an approach.

13 **Q. WHAT IS THE DIFFERENCE BETWEEN THE TELRIC METHODOLOGY**
14 **AS PROPOSED BY THE FCC AND THE TSLRIC METHODOLOGY**
15 **ADOPTED BY THIS COMMISSION?**

16 A. TELRIC and TSLRIC are both measures of average incremental costs; both are based on
17 the same general costing logic. In fact, the FCC refers to TELRIC as the application of
18 TSLRIC principles to network elements and BellSouth uses its TELRIC model and
19 TELRIC Calculator to produce both TELRIC and TSLRIC estimates. These methods do
20 differ, however, in two broad respects.

21 First, a TSLRIC focuses initially on services, whereas a TELRIC focuses on network
22 elements. It is not unusual for network elements to be used to provide multiple services.

1 Thus, there may be a number of costs and expenses that are directly attributable to a
2 network element, but are shared among the services using these elements. As such,
3 there are a number of costs and expenses which are considered direct in a TELRIC, but
4 are considered shared in a TSLRIC.

5 Second, TSLRIC typically examines costs of services in the retail or end-user
6 market, whereas, TELRIC focuses on costs to service providers, i.e., in the "wholesale"
7 market. As such, there are certain retail-related costs and expenses that are properly
8 included in a TSLRIC that should be excluded from a TELRIC.

9 Since the differences between a TSLRIC and a TELRIC deal more with application
10 than concept, I will use the terms TSLRIC and TELRIC interchangeably in what follows.

11 **Q. WHY DOES TELRIC PROVIDE A REASONABLE MEASURE OF COSTS**
12 **FOR PRICING PURPOSES?**

13 A. Using TELRIC will result in prices for network elements which reflect forward-looking,
14 efficiently incurred costs. As noted, it is appropriate that prices be based on forward-
15 looking costing methodologies. Efficient decisions regarding market entry, exit and
16 expansion are based on forward-looking comparisons of expected revenues and expected
17 costs. To ensure that price signals are correct and that market entry is efficient, forward-
18 looking costs should be used.

19 The appropriate cost study is also *long run in nature*, i.e., it is based on a time
20 horizon long enough to allow entry or exit to occur and/or for substantial changes in
21 capacity or technology to occur. Costs affecting entry, exit, capacity expansion or
22 technology adoption decisions are forward-looking and variable. A properly structured

1 **cost measure or cost study** should, therefore, include forward-looking capital costs and
2 **maintenance expenses**, and the preponderance of all other expenses should be viewed as
3 **variable, i.e., shared and common** costs should amount to a relatively small fraction of
4 **total costs**.

5 The relevant increment of demand to estimate interconnection or network element
6 costs is the *total demand by all users*, including the incumbent. Hence, the “total service”
7 or “total element” designation. ILECs realize economies of scale. Focusing on any
8 **volume of output smaller than the total market** may result in higher estimates of per unit
9 **costs than are actually realized**.

10 The incremental cost calculation is intended to capture the added cost from
11 **producing or the cost avoided from discontinuing the service**, assuming all other ILEC
12 **outputs remain unchanged**. For example, the incremental cost of a switch port is
13 **calculated assuming no change** in the volume of loops, and the incremental cost of loops
14 **is calculated assuming no change** in the volume of ports. Since all else is held constant,
15 **the calculations focus exclusively on the cost of the unbundled network element**.

16 Similarly, the study should capture all costs associated or attributable to that network
17 **element, but only those so attributed**. For instance, the cost of an unbundled voice-grade
18 **loop should be based on a network designed for narrowband, voice-grade services**. Costs
19 **not necessary for the provision of this grade of service** should not be included in the cost
20 **study**.

21 The TELRIC/TSLRIC model is a method that adheres to these principles and, thus,
22 **promotes the competitive outcome**.

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1 Q. IS THE TELRIC CONCEPT AS DESCRIBED BY THE FCC
2 ECONOMICALLY SOUND?

3 A. Yes. The FCC adopted specific requirements in its *First Report and Order* governing the
4 methodology to be used in developing cost-based rates for interconnection and unbundled
5 elements (including transport and termination) which are consistent with the economic
6 principles I outlined above. The FCC's general pricing standard requires that rates be
7 established equal to what is termed the forward-looking economic cost of an element.
8 This forward-looking economic cost of an element is defined by the FCC as the sum of
9 the total element long-run incremental cost of the element (TELRIC), and a reasonable
10 allocation of forward-looking joint and common costs.² These costing and pricing
11 principles adopted by the FCC governing pricing rules are economically sound and are
12 designed to promote the competitive outcome.

13 The merits of the TELRIC approach were not addressed by the Eighth Circuit in
14 vacating portions of the *First Report and Order*, or by the Supreme Court in its recent
15 decision reinforcing the jurisdictional basis on which the FCC could determine the
16 pricing methodology.³ With respect to the pricing methodology, the Supreme Court (p.
17 10) ruled

18 We think that the grant in §201(b) means what it says: The FCC
19 has rulemaking authority to carry out the "provisions of this Act."
20

²*First Report and Order*, Appendix B-Final Rules, §51.505(d).

³Supreme Court of the United States, Nos. 97-826, 97-829, 97-830, 97-831, 97-1075, 97-1099 and 97-1141; *AT&T Corporation, et al., Petitioners (97-826) v. Iowa Utilities Board et al.*; on writs of certiorari to the United States Court of Appeals for the Eighth Circuit; Jan. 25, 1999; Opinion of the Court.

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1 which include §§251 and 252, added by the Telecommunications
2 Act of 1996.

3
4 Thus, this ruling confirms the FCC's authority to establish TELRIC as the pricing
5 standard which states must apply.⁴

6 **Q. HAS BELLSOUTH PROVIDED A CURRENT, RELIABLE TELRIC?**

7 A. No. As indicated, it is my understanding that BellSouth will file new TELRIC studies on
8 February 4, 1999; and I plan to provide recommendations based on the BellSouth's
9 TELRIC models once those are available and can be evaluated.

10 **Q. ABSENT COST ESTIMATES BASED ON THE BELLSOUTH TELRIC**
11 **MODEL, ARE THERE OTHER APPROACHES AVAILABLE TO THE**
12 **COMMISSION TO SET COST-BASED RATES FOR INTERCONNECTION**
13 **AND UNES?**

14 A. A primary objective and result of the TELRIC estimate is to determine a rate that is cost-
15 based. Absent a reliable current TELRIC, one method of approximating cost is to look at
16 the lowest rate or charge currently offered by the RBOC for a particular service, activity
17 or functionality. Under the assumption that current retail rates exist which include that
18 functionality or activity and that those charges cover the cost of the functionality, the
19 lowest rate offered for a service including the particular function or activity should
20 provide an approximation of the forward-looking, efficient cost (including a reasonable
21 mark-up for shared and common costs).

⁴Ibid., p. 16; "The FCC's prescription, through rulemaking, of a requisite pricing methodology no more prevents the states from establishing rates than do the statutory "Pricing standards" set forth in §252(d)." ... p. 17. "We hold, therefore, that the Commission has jurisdiction to design a pricing methodology."

1 Q. PLEASE EXPLAIN WHY THE LOWEST RATE OFFERED WILL BE AN
2 APPROXIMATION OF A TELRIC-BASED COST.

3 A. The desirable property of a TELRIC cost is that it yields an approximation of the rate(s)
4 that would prevail in a competitive market. The benefits of the workings of a competitive
5 market being the ultimate goal, the interim methodology for selecting charges for UNEs
6 and interconnection services should lead as close to that cost-based solution as possible.
7 That is, as close to a forward-looking efficient cost as possible, including a reasonable
8 mark-up for shared and common.

9 ILECs offer service under standard tariffs, on an individual case basis and under
10 other types of arrangements (e.g., a price cap regulation). Assuming retail rates exist for
11 services or functionalities that are comparable to the UNE, one can look to the ILEC's
12 charges for that service or functionality for a proxy to the TELRIC approach.
13 Specifically, once the comparable retail rates are identified, the lowest rate offered for
14 that service is the one most likely to approximate the efficient, forward-looking
15 characteristics of the TELRIC. Further adjustments may be necessary to eliminate the
16 costs of retail functions that may be embedded in the retail rate chosen. Similarly, the
17 retail rate is likely to contain costs for other functionalities, in addition to the retail
18 functions just mentioned, since retail services are unlikely to be unbundled to the same
19 extent as the UNEs requested. To the extent the functionality is offered on an individual
20 case basis and faces some competition, the retail tariff will also overstate the cost proxy.

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1 Assuming price differences are market related, and not cost based, it is the lowest
2 retail rate which will more closely approximate a TELRIC and, thus, a competitive,
3 result.⁵

4 **Q. ARE YOU FAMILIAR WITH ICI'S PROPOSAL FOR INTERIM**
5 **CHARGES?**

6 **A.** Yes, I am. Given the expedited nature of this proceeding and the lack of BellSouth
7 TELRIC results, this is a reasonable interim approach, consistent with the approach
8 which I have just described.

9 **C. ACCESS TO UNBUNDLED ELEMENTS AND INTERCONNECTION**

10 **Q. YOU INDICATED THAT BOTH PRICING AND ACCESS WERE**
11 **IMPORTANT IN ACHIEVING THE GOALS OF THE ACT. PLEASE**
12 **SUMMARIZE THE ROLE OF ADEQUATE ACCESS TO UNBUNDLED**
13 **ELEMENTS AND INTERCONNECTION IN ACHIEVING THOSE GOALS.**

14 **A.** The Act calls for the market for telecommunications services to be transformed from one
15 of regulated monopoly to one of market competition. The approach adopted by Congress
16 accomplishes this through a policy of open and expedited entry, rather than through
17 divestiture forced upon the incumbent LECs. Thus, the success of this transition to
18 competition rests critically on whether commissions are able to remove artificial barriers
19 to entry into these markets. The paradigm laid out in the Act to accomplish this has two
20 critical components: pricing and access (availability). The pricing concerns were

⁵As I noted in my discussion of de-eraging, cost-based differences exist for loops, but few other elements have been found to exhibit this geographic cost differential

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1 discussed earlier. Adequate access requires, as I noted above, that all segments of the
2 ILEC network be open for entry, through the availability of unbundled network elements
3 and interconnection arrangements provided at TELRIC cost and/or through availability of
4 services for resale. Limitations to such, conditioned on requirements which artificially
5 and unnecessarily increase the cost to CLECs, will deter or even eliminate competition.

6 Consequently, there are very important economic issues and implications associated
7 with unbundling. From an economic policy perspective, the successful achievement of
8 the goals of the Act (such as the competitive outcome) requires that all segments of the
9 ILEC network be made available to CLECs pursuant to the unbundling and resale
10 provisions of the Act. Inadequate unbundling creates barriers to entry which work to
11 prevent the competitive outcome.

12 **Q. HOW CAN UNBUNDLING AFFECT BARRIERS TO ENTRY?**

13 A. Incumbents have an obvious incentive to increase the costs of competing providers,
14 whenever possible. One way to do this is to bundle elements or develop rate structures in
15 such a way that CLECs are forced to take and to pay for unnecessary elements.⁶ If the
16 competitive outcome is to be promoted, however, there should be no barriers that
17 artificially discourage CLECs from entering a market or from offering services using their
18 own equipment. From a financial perspective, inflated costs can be an entry barrier, and

⁶Since the ILEC also competes for the customers targeted by CLECs, the ILEC has an obvious incentive to discourage the entry of competitors to the extent it can. To accomplish this, the CLEC could be forced to purchase unneeded services as part of a bundle in order to get the service or access to the facility that is actually needed for it to provide the particular telecommunications service in question. Or, the ILEC may bundle a "bottleneck" function with other nonessential functions in a way that unnecessarily increases the cost to CLECs, creating a relative advantage for the ILEC and a disincentive for CLEC entry.

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1 as such frustrate a policy of promoting the competitive outcome. The level of bundling,
2 the rate "structure," and the flexibility of the offerings to CLECs by incumbent LECs
3 should be such that CLECs do not pay unnecessary or uneconomic costs.

4 In addition to the other requirements of Section 251(c), each incumbent LEC has a
5 duty to provide, to any requesting telecommunications carrier, the following:

6 nondiscriminatory access to network elements on an unbundled basis at
7 any technically feasible point on rates, terms and conditions that are just,
8 reasonable and nondiscriminatory in accordance with ... this section and
9 section 252.⁷

10
11 Therefore, incumbent LECs have a duty to provide nondiscriminatory access to
12 equipment and facilities needed to provide voice or advanced services to the extent
13 technically possible, and at rates based on forward-looking costs.

14 **Q. DOES THE RECENT 706 ORDER ADDRESS UNBUNDLING?**

15 **A.** Yes, it does. The FCC's recent ruling in the 706 Order concluded that efficient entry and
16 the competitive outcome require the widespread unbundling of network elements.
17 Specifically, the FCC found that the facilities used in the provision of all advanced
18 services, including packet-switched services and collocation are subject to the unbundling
19 requirements of Section 251(c).⁸ In that Order, the FCC ruled that ILECs must offer

⁷Section 251(c)(3).

⁸706 Order ¶57 (... all equipment and facilities used in the provision of advanced services are "network elements" as defined by Section 153(29).) "Network elements" is defined to include any facility or equipment used to provide a "telecommunications service," and includes any "features, functions and capabilities that are provided by means of such facility or equipment." 706 Order, ¶50. ¶52 clarifies that this applies to loops capable of transporting high speed digital signals, and ¶57 clarifies that it applies to "advanced services" and the facilities and equipment used to provide advanced services.

1 unbundled access to the “equipment used in the provision of advanced services.” This
2 ruling is subject only to consideration of technical feasibility.⁹

3 **Q. WHAT IS THE RESULT OF THE SUPREME COURT’S DECISION AS IT**
4 **RELATES TO UNBUNDLING?**

5 A. The Supreme Court recently issued its ruling on the 8th circuit’s decision on the FCC’s
6 First Report and Order on Local Competition (Docket 96-98).¹⁰ Technically, the Supreme
7 Court decision vacates 47 CFR §51.319 (Rule 319) which is the section of the FCC rules
8 listing the elements which, at minimum, must be provided. The Supreme Court did not
9 rule on the propriety of the specific elements in Rule 319, but found that the FCC must
10 establish a “standard” as the basis for determining which elements must be made
11 available. This standard according to the Supreme Court decision must

12 ... tak[e] into account the objectives of the Act and giving some
13 substance to the “necessary” and “impair” requirements.¹¹

14
15 **Whether the implementation of this standard increases or decreases the FCC’s list of**
16 **minimum elements remains to be seen. However, the above discussion in this Section II**
17 **with respect to unbundling employs exactly the objectives of the Act and, explicitly takes**
18 **into consideration the “necessary” and “impair” requirements discussed by the Supreme**
19 **Court.**

20 Section 251(d)(2) of the Act defines the “necessary” and “impair” standard of access
21 to network elements.

⁹706 Order, ¶11.

¹⁰Opinion of the Court, op. cit.

¹¹Ibid., p. 27

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1 In determining what network elements should be made
2 available for purposes of subsection (c)(3), the Commission shall
3 consider, at a minimum, whether --

4 (A) access to such network elements as are proprietary in nature is
5 necessary;

6 (B) the failure to provide access to such network elements would impair
7 the ability of the telecommunications carrier seeking access to provide the
8 services that it seeks to offer. §2519(d)(2)
9

10 The necessary/impairment standard I have used relates to the impairment of competition
11 (through removal of entry barriers), not the impairment of a CLECs ability to earn above
12 normal profits. This is consistent with the Supreme Court ruling. The Supreme Court
13 decision does not impose an antitrust-type "essential facilities" standard, but is clearly
14 supportive of an objective or standard defined in terms of the impact on entry barriers and
15 competition, Section 253 of the Act [*Removal Of Entry Barriers*], which deals primarily
16 with state and local requirements, also is supportive of using a standard which considers
17 the impact on entry barriers. Removal of entry barriers, like cost-based pricing, is
18 synonymous with promoting competition.

19 **Q. SHOULD BELLSOUTH BE REQUIRED, FOR EXAMPLE, TO PROVIDE**
20 **FOUR-WIRE DSO LOOPS AND, DS3, OC3, OC12 OR OC48 LOOPS AS**
21 **UNBUNDLED ELEMENTS?**

22 A. Yes. Unless BellSouth can demonstrate a technical reason why it cannot provide an
23 element, including any particular loop, these loops should be available at cost-based rates.
24 As I indicated, from an economic policy perspective, fulfilling the goals of the Act
25 requires that *all* segments of the ILEC network be available at economically based prices
26 and at non-discriminatory terms and conditions. What I have referred to as adequate
27 access or availability does not exclude certain loops, or interconnection associated with

1 certain types of service, or unbundled transport, or any other necessary
2 element/function/service simply because (a) they have not been offered before or, (b)
3 because the ILEC has not yet completed cost studies or (c) because the loop, UNE or
4 function is associated with an advanced service rather than a voice grade service. Public
5 policy considerations, and not the ILEC's commercial interests, should be the basis of
6 decisions on the extent of unbundling.

7 In addition, attempts to exclude any UNE, service or function is inconsistent with
8 the Act and the 706 Order (subject to only "technically feasible" constraints). The
9 successful elimination of entry barriers requires access to all such elements at forward-
10 looking cost based rates. The loop elements discussed above, as well as the other
11 elements and interconnection sought by Intermedia, are not constrained by technical
12 feasibility.

13 **Q. IS THE INTERMEDIA REQUEST FOR ADDITIONAL UNBUNDLED**
14 **NETWORK ELEMENTS CONSISTENT WITH THE ACT?**

15 A. Yes. As I explained, the Act selected entry as the vehicle to transform the market for
16 local services from one of regulated monopoly to one that is structurally competitive.
17 Intermedia is asking that network facilities that are in place and used by BellSouth be
18 made available as unbundled network elements. The elements include copper and fiber
19 loop facilities, subloop unbundling, high capacity transport facilities, xDSL and packet
20 switching facilities, among others. These requests are consistent with the open-entry
21 provisions of the Act.

1 **D. IMPUTATION**

2 **Q. WHAT ARE THE ECONOMIC CONSEQUENCES OF DISCRIMINATION?**

3 A. Discrimination provides an advantage to one or a group of market participants. For
4 instance, if the ILEC charged the CLECs amounts that differed from the costs incurred, or
5 if the ILEC provides network elements under terms and conditions dissimilar to those it
6 experiences in its own operations, barriers to entry may result (as entry will be more
7 costly or more difficult for the CLEC). By requiring that prices (as well as terms and
8 conditions) for network elements and interconnection are non-discriminatory, the relative
9 efficiencies of the market participants -- and not the prices charged -- will determine
10 market performance, market share and the market outcome.

11 If prices are discriminatory, an anticompetitive price squeeze may result. Price
12 squeeze occurs when the ILEC prices an input that is used by a CLEC to provide a service
13 (in competition with the ILEC) at a level that puts the CLEC at an automatic disadvantage
14 and, thus, effectively bars entry. For instance, if the price BellSouth charges a CLEC for
15 an unbundled network element is higher than the price BellSouth charges its own end
16 user for the retail service which uses that UNE, a price squeeze results. The CLEC can be
17 more efficient than BellSouth and yet because of the price charged for the UNE, the
18 CLEC cannot expect to operate in this market and fully recover its costs. Entry is
19 blocked by the price squeeze. Imputation is a policy that addresses the need to deal with
20 the price squeeze and cross-subsidy issues which inevitably arise in an industry where one
21 firm has market power in the wholesale market and competes with others in the retail or
22 end use market.

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1 Q. **HOW CAN THE COMMISSION ADDRESS THIS MATTER?**

2 A. The Commission can address this matter by establishing an imputation requirement. The
3 ILEC has control over certain input facilities and functions (which the ILEC also uses in
4 the provision of its own retail services) needed by a CLEC to provide telecommunications
5 services. It is this control over "bottleneck" or "essential" facilities and functions which
6 creates potentially non-competitive problems and which creates the potential for anti-
7 competitive problems.

8 Q. **WOULD YOU PLEASE EXPLAIN?**

9 A. Yes. When the ILEC has market power over the services/functions required by the
10 CLEC, and the ILEC competes with the CLEC to provide the same retail service, there is
11 an incentive, facilitated and disguised by the bundling involved, to engage in price
12 discrimination. If the ILEC can effectively charge competitors a higher price for these
13 functions than it incurs itself, the ILEC will have a market advantage of the type
14 specifically proscribed by the Act. Under the Act, ILECs must make these functions or
15 services available at rates that are just, reasonable and non-discriminatory. Charging
16 CLECs costs which exceed the costs the ILEC in essence charges itself clearly violates
17 the non-discrimination provision of the Act. Other non-competitive activities are
18 possible as well. For example, the ILEC may use high prices for functions over which it
19 has market power to subsidize its services that are subject to more competitive forces.

20 Importantly, if the ILEC's cost of providing these functions is lower than the charge
21 to competitors (i.e., the rate CLECs must pay) for the identical function, the ILEC can
22 charge a lower end-use rate (than can its competitors) for any service that uses that

1 function. That is, the ILEC can beat the CLEC's price even when the CLEC is the
2 technically more efficient provider. Thus, competitive entry does not occur, competition
3 is impaired, and the promised benefits of competition will not occur.

4 Finally, competitive neutrality implies not only that rates be cost based and non-
5 discriminatory, but that the rates not negatively affect the ability of CLECs to compete
6 with the ILEC or other carriers. A rate charged which is not based on economic cost, or
7 which exceeds the rate an ILEC would charge itself and its own customer for the same
8 function, is not competitively neutral and will discourage efficient entry.

9 **Q. IS THIS THE SAME PROBLEM DESCRIBED BY MS. STROW IN**
10 **SECTION VIII OF HER TESTIMONY?**

11 A. Yes. In her section, which she refers to as "Pricing Parity," Ms. Strow describes an
12 incident in which Intermedia was disadvantaged in a response to a request for proposals
13 by the State of Georgia because BellSouth's retail proposal to that state was at rates less
14 than the "wholesale" rates to Intermedia. Obviously, a competitive provider cannot buy
15 given elements/services at rates that exceed the ILEC's retail offerings, and compete.¹²
16 This is true, even if the CLEC is the more efficient of the two.

17 If the cost to the CLEC for the "wholesale" functions exceeds the ILEC's retail rate,
18 obviously the ILEC is not *charging itself* the same rate as it is charging the CLEC.

19 **Q. PLEASE EXPLAIN HOW AN IMPUTATION POLICY CAN BE**
20 **IMPLEMENTED.**

¹²Additionally, the CLEC must include an overhead and its other costs.

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1 A. One method of implementing an imputation policy would be to require that BellSouth
2 charge a CLEC no more than it "charges itself" for a similar element, service or
3 functionality.

4 To help understand how an imputation policy would be implemented, consider the
5 following hypothetical. BellSouth provisions a particular service utilizing two cost
6 components, which I simply call A and B. A is a network element over which BellSouth
7 has extensive market control, and for which an unbundled network element must be made
8 available. Component B is made up of a variety of activities and expenses incurred by
9 BellSouth in providing the final service, but which are not subject to unbundling or
10 necessarily made available in the form of an unbundled network element. An imputation
11 policy will require BellSouth to impose upon itself a *cost* for pricing purposes equal to
12 the sum of the TELRIC for component A¹³ and the TSLRIC for component B. This is
13 consistent with the non-discriminatory pricing, and efficiency conditions described above.

14 Q. **HOW WOULD IMPUTATION STANDARDS ADDRESS THE CONCERNS**
15 **YOU EXPRESSED ABOVE?**

16 A. This policy has two important implications. First, it results in rates that are non-
17 discriminatory. Both BellSouth and the CLECs would be subject to the same prices for
18 UNEs (based on the ILEC's costs). Second, it would promote efficiency in the market for
19 communications services. With BellSouth and the CLECs being charged the same price
20 for similar elements or functionalities (i.e., for UNEs), it would be the relative

¹³The imputed amount should be the price for the UNE in question, Component A in this instance. The assumption is that the UNE price is equal to the TELRIC. TELRIC includes a reasonable profit and thus meets the pricing requirements of Section 252(d) of the Act

1 efficiencies of the two organizations in the more competitive aspects of their operations
2 that would determine the least cost producer. Similarly, with this policy, the least cost
3 producer would be able to establish a lower price, capture a larger market share and/or
4 earn higher profits. Moreover, if BellSouth is forced to charge itself and the CLEC the
5 same price for similar functionalities, BellSouth has every incentive to improve the
6 efficiency of the remaining components in order to ensure that it can compete.
7

8 **III. NRCs**

9 **Q. WHAT ARE NON-RECURRING CHARGES?**

10 A. Non-recurring charges ("NRCs") are the charges which an ILEC assesses to recover the
11 one-time or non-recurring costs associated with establishing, moving and/or changing the
12 service received by a particular customer. Typically, NRCs consist of multiple elements
13 which include charges for activities such as service orders, central office line connections
14 and premise visits. Non-recurring charges are based on labor intensive activities, whereas
15 recurring charges are based on capital intensive activities.

16 **Q. WOULD YOU PLEASE SUMMARIZE THE CONSIDERATIONS FOR**
17 **ESTABLISHING CHARGES FOR NON-RECURRING ACTIVITIES?**

18 A. Yes. There are several considerations that are necessary in establishing prices for non-
19 recurring charges for unbundled network elements.

20 First, non-recurring charges can serve as a barrier to entry. These are one-time, up-
21 front charges that are incurred before service or the underlying element is provided. In
22 that regard, an excessive non-recurring charge may have a greater deterrence than does an

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1 excessive recurring charge. To allow Bell South the opportunity to fully recover all costs
2 incurred, but to prevent anticompetitive pricing (i.e., entry barriers), charges for non-
3 recurring activities should be based on the same standards as are charges for recurring
4 activities. NRCs should be forward-looking, cost based, and include recovery of a
5 reasonable overhead, as discussed in Section IIB.

6 Another consideration involves the potential for discriminatory pricing (even at
7 alleged cost based charges), and how the market can be used to maintain a benchmark for
8 comparison. That is, the Commission should consider establishing a ceiling for non-
9 recurring charges to CLECs associated with unbundled network elements at the level
10 which would apply if BellSouth were providing this service to a customer which it serves
11 directly, less any retail costs which the ILEC does not incur in serving the CLEC instead
12 of a retail end user. This ceiling serves two purposes. One, it provides a reasonableness
13 check on any cost study provided by BellSouth in this proceeding. Two, it ensures that
14 the non-recurring charges established are truly non-discriminatory. As discussed above
15 with regard to price squeeze, if BellSouth is allowed to establish a charge to its
16 competitors that is allegedly cost based, yet exceeds the costs that it would incur in
17 providing service to itself, the goal of fostering competition is thwarted. More
18 specifically, the ceiling should be set at the charge established by the Commission for
19 non-recurring activities associated with end-use services, less the wholesale discount
20 established by the Commission.

21 **Q. THE COMMISSION HAS RECENTLY ADDRESSED NON-RECURRING**
22 **CHARGES FOR THE UNES CURRENTLY IN PLACE. WHY IN YOUR**

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1 **OPINION ARE THOSE CHARGES NOT APPROPRIATE FOR A NEW**
2 **CONTRACT, AS INTERMEDIA IS SEEKING HERE?**

3 A. When the Commission set NRCs, it based its decision on the best cost information
4 available at that time. In some instances, cost data may remain reasonably accurate over
5 the next one, two or more years; in others, they may not. The available data suggest that
6 cost information regarding many of the NRCs is likely to change materially over the near
7 term. The NRC for loop elements is a clear case in point. BellSouth's cost estimates are
8 based in part on using its legacy system for taking service orders for loop UNEs and
9 provisioning these UNEs. BellSouth has suggested that the unbundled loop provisioning
10 process bears resemblance to that of a design circuit -- e.g., a special access line -- rather
11 than that of a POTS loop. It is also my understanding that BellSouth expects its estimate
12 of the difference in the cost of providing an unbundled loop and a POTS loop to diminish
13 with time. Thus the cost estimate for NRCs can be expected to change materially over a
14 period as short as one year. Cost estimates set for contract rates expected to last into the
15 next one, two or more years, should be reviewed to ensure that they are consistent with
16 what is currently the best information available.

17 Q. **ILECs HAVE ASSERTED THAT IT IS LESS COSTLY TO PROVIDE**
18 **SERVICE TO THEMSELVES THAN TO PROVIDE SERVICE TO**
19 **COMPETITORS. SHOULD THAT BE CONSIDERED WHEN**
20 **ESTABLISHING NRCS?**

1 A. No. There are both efficiency and equity considerations that suggest that the costs, net of
2 ILEC retail marketing activities, of performing a non-recurring activity should be
3 considered the same, whether undertaken on behalf of the ILEC or a CLEC.

4 First, the approximate costing methodology is a total element long run incremental
5 cost (TELRIC). TELRIC is the forward-looking per unit incremental cost of providing
6 the entire volume of service, net of ILEC retail marketing activities, assuming the most
7 efficient technology currently available. A single TELRIC is established for unbundled
8 loops or ports, for instance, irrespective of whether the element is to be used by the ILEC
9 or sold to a CLEC, or whether the end user is a residence or business customer.
10 Similarly, the TELRIC based cost for a non-recurring activity should be the same
11 irrespective of the service provider or of the end user.

12 Second, and somewhat related, is that a properly structured TELRIC presumes that
13 the ILEC is separated into two operating divisions, a wholesale element provider and a
14 retail service provider. The non-recurring charge is that which would be levied by the
15 wholesale element provider to any and all retail service providers, irrespective of whether
16 that retail service provider were the ILEC or a CLEC. The same costs and the same cost
17 based rates should apply to both.

18 Third, even if one accepts arguendo that the cost of the ILEC providing service to
19 itself is less than that of providing service to a CLEC, allowing the ILEC to take
20 advantage of its monopoly position in establishing costs and rates is clearly inconsistent
21 with the competitive goal established by the Telecommunications Act. The result would

1 be an unwarranted competitive advantage realized by the ILEC, thwarting the non-
2 discriminatory, pro-competitive goals of the Act.

3 In short, there are both efficiency and equity considerations which argue strongly for
4 comparability in establishing NRCs associated with ILEC and CLEC activities.

5 **Q. WHAT IS YOUR RECOMMENDATION FOR THE NRCs TO THE CLECS?**

6 A. As noted, NRCs should be based on the efficiently incurred, forward-looking expenses of
7 these functions. This requirement leads to two considerations in setting NRCs for UNEs.

8 First, the cost estimates should be reviewed with some frequency. Providing UNEs
9 is an activity never before performed by ILECs. Greater experience should result in
10 improved capability in measuring and capturing the relevant costs, and in the efficiency
11 with which the provisioning occurs. Further, reliance on legacy systems will diminish
12 over the next few years. Cost estimates used to set charges for existing contracts should
13 not be used to set rates for contracts expected to last one, two and more years into the
14 future.

15 Second, for NRCs to be non-discriminatory, they should be capped at the rate
16 charged by BellSouth for comparable end use services, less the appropriate avoided cost
17 adjustment.¹⁴ As an example, the NRC for a POTS loop UNE should not be higher than
18 the NRC for a retail business POTS loop.

19 **Q. IS THERE A REASONABLE TELRIC-BASED COST ESTIMATE FOR THE**
20 **NRCs AT ISSUE IN THIS PROCEEDING?**

¹⁴An alternative is to set the NRC for the end use service at the sum of the relevant UNEs plus the appropriate retail costs excluded from the measure of UNE recurring costs

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1 A. Not at this time. Although TELRIC-based data has been developed in the past for
2 selected items, this did not include all of the elements and interconnection services
3 needed by CLECs. It is my understanding that BellSouth will be filing updated or revised
4 TELRIC studies very soon. However, at this time I have not seen those studies. I plan to
5 review and, if possible, use those studies to make recommendations for NRCs once the
6 studies are available.

7
8 **IV. COLLOCATION**

9 **Q. PLEASE EXPLAIN WHAT IS MEANT BY COLLOCATION?**

10 A. Collocation involves the placement and connection of one telecommunications carrier's
11 equipment (located on the premises of another telecommunication carrier) to the
12 equipment (network) of the host carrier. Collocation can be physical or virtual.

13 **Q. WHAT ARE THE COLLOCATION REQUIREMENTS OF THE ACT?**

14 A. Section 251(c)(6) of the Act addresses unbundling. That portion of the statute provides
15 ... for the physical collocation of equipment necessary for
16 interconnection or access to unbundled network elements at the premises
17 of the local exchange carrier, except that the carrier may provide for
18 virtual collocation if the local exchange carrier demonstrates to the State
19 commission that physical collocation is not practical for technical
20 reasons or because of space limitations.

21
22 **Q. DID THE FCC ADDRESS COLLOCATION?**

23 A. Yes. Section 251(c)(6)¹⁵ of the Act requires ILECs to provide for collocation on rates,
24 terms and conditions that are just, reasonable, and non-discriminatory.¹⁶ The FCC

¹⁵ *Additional Obligations of Incumbent Local Exchange Carriers*

¹⁶ This is the same language used in the Act for unbundled access and interconnection.

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1 adopted national rules for physical and virtual collocation.¹⁷ The FCC found that specific
2 rules defining minimum requirements for non-discriminatory collocation arrangements
3 were necessary:

4 Our experience in the *Expanded Interconnection* proceeding indicates
5 that incumbent LECs have an economic incentive to interpret regulatory
6 ambiguities to delay entry by new competitors. We and the states should
7 therefore adopt, to the extent possible, specific and detailed collocation
8 rules.¹⁸
9

10 The FCC's findings were consistent with the incentives discussed above for ILECs
11 to increase the costs of competing providers, if possible.

12 The FCC subsequently acknowledged collocation as a potential entry barrier to
13 CLECs in the provision of advanced services (as well as local voice services).

14 One of the major barriers facing new entrants that seek to provide
15 advanced services on a facilities basis is the lack of collocation space in
16 many LEC central offices ... Because incumbent LECs have the
17 incentive and capability to impede competition by reducing the amount
18 of space available for a collocation by competitors, the Commission, in
19 the Local Competition Order, required incumbent LECs that deny
20 requests for physical collocation on the basis of space limitations to
21 provide the state commission with detailed floor plans or diagrams of
22 their premises.¹⁹
23

24 ... we believe that incumbent LECs have a statutory obligation to offer
25 cost efficient and flexible collocation arrangements.²⁰
26

27 As I have discussed, the policy approach should be one which ensures that costs are

¹⁷ *First Report and Order*, CC Docket No. 96-98, Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, ¶551 and ¶¶653-772, August 8, 1996.

¹⁸ *Ibid.*, ¶558.

¹⁹ 706 Order (*Advanced Services Order*), ¶145.

²⁰ *Ibid.*, ¶64.

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1 Q. **HOW DOES COLLOCATION POLICY RELATE TO THE DEVELOPMENT**
2 **OF LOCAL COMPETITION?**

3 A. The terms and conditions, including pricing, of collocation are critical to the development
4 of local competition. For competition to successfully emerge, it is necessary that CLECs
5 be able to interconnect with the incumbent's network to exchange traffic. As noted, the
6 Act establishes a framework for access to the ILECs' facilities on an unbundled network
7 element basis. For most CLECs, collocation is necessary to access unbundled network
8 elements most efficiently, and should be made available under rates, terms and conditions
9 which do not create barriers to entry.

10 Q. **HOW CAN COLLOCATION TERMS BE A BARRIER TO ENTRY?**

11 A. From an economic perspective, collocation is no different than an unbundled network
12 element, as it allows the entrant necessary access to an essential portion of the
13 incumbent's network. As discussed in Section II above with respect to unbundling,
14 pricing or inadequate access can become an artificial barrier to entry. Whether the price
15 charged for this facility is excessive, or the CLEC is required to purchase a component of
16 collocation that is not necessary, entry barriers are created as the entrant will immediately
17 be placed at an economic disadvantage. Competition will be harmed as a barrier to
18 competitive entry will result.

19 Collocation options can help eliminate barriers and promote efficient market entry.
20 In a competitive market, firms can be expected to seek alternative methods of achieving
21 collocation to reduce the cost, or of finding lower cost alternatives to collocation. Not all
22 firms will find the same collocation options attractive. The Commission should ensure

1 that a number of collocation options be available, subject to technical feasibility
2 constraints. Otherwise, the lack of availability (or lack of flexibility) creates barriers to
3 entry.

4 The collocation policy should recognize that collocation space is finite and, thus, is
5 obviously a potential barrier. Increasing central office space may be costly. An
6 alternative is to pursue policies that minimize the space required for collocation.
7 Cageless collocation, sharing of space and subleasing allow a scarce resource (collocation
8 space) to be utilized by a greater number of CLECs. A second is to allow reasonable
9 offsite collocation which expands the supply of the limited resource. Closet POPs in
10 neighboring buildings are one such example.

11 Similarly, requiring ILECs to provide the CLEC with an extended link reduces the
12 entry barrier created by unavailable or uneconomic collocation. This approach also
13 prevents ILECs from forcing CLECs to purchase expensive collocation unnecessarily.

14 Another rather subtle option is to allow CLECs to self-provision collocation.
15 Among other things, this provides a market-based reality check on the charges levied by
16 the ILEC.

17 **Q. WOULD YOU PLEASE EXPLAIN WHAT IS MEANT AN EXTENDED**
18 **LOOP?**

19 A. Yes. An Extended Loop consists of a loop, multiplexing and the transport from the
20 BellSouth end office serving an end-user to the CLEC switch; and allows CLECs access
21 to customers served from a BellSouth end office in situations where the CLEC either
22 cannot collocate (due, for example, to space limitations or delays in obtaining the

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1 necessary provisioning from the ILEC), or where it is not yet financially possible for the
2 CLEC to have a physical collocation in all end offices. It takes time as well as capital for
3 CLECs to expand their facilities. Thus, even where it is the intent of the CLEC to
4 eventually collocate in a given set of end offices, it cannot be everywhere at once. The
5 CLEC must prioritize and work with the ILEC in moving toward that goal. In the
6 meantime, a reasonable alternative to that collocation must be available if competition is
7 to progress.

8 **Q. IS AN UNBUNDLED EXTENDED LINK IS TECHNICALLY FEASIBLE?**

9 A. Yes. Extended links are currently used by ILECs, including BellSouth. There is no basis,
10 technical or economic, why the ILECs should not provide extended links at cost-based
11 rates.

12 **Q. WHAT OTHER CONCERNS DO YOU HAVE?**

13 A. My remaining concerns involve the pricing/costing methodology. This Commission
14 should ensure that BellSouth's charges for collocation are cost based and procompetitive.
15 For instance:

- 16 (1) Care must be taken to ensure that there not be double recovery of costs, once through
17 UNEs, then again through collocation charges;
18
19 (2) The method by which shared costs of collocation are included in collocation charges
20 should be non-discriminatory;
21
22 (3) Costs should be recovered in a manner consistent with how they are incurred. Doing
23 otherwise runs the risk of inefficient price signals and of the overrecovery of costs:
24 additionally, there is temptation to try to recover through associated non-recurring
25 costs any recurring costs the Company may not be allowed to recover in other UNE
26 rates;
27
28 (4) Anticompetitive allocation of overhead costs should be avoided;
29

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1 (5) And, costs associated with items that the entrant does not need in order to provide
2 service, and does not want, should not be included.
3

4
5 **Q. WHAT IS YOUR CONCERN WITH REGARD TO DOUBLE RECOVERY**
6 **OF COSTS THROUGH CHARGES FOR UNBUNDLED NETWORK**
7 **ELEMENTS AND THEN AGAIN THROUGH CHARGES FOR**
8 **COLLOCATION ACTIVITIES.**

9 A. The ILECs have typically undertaken cost studies for UNEc using traditional costing
10 methods. These methods have been developed in an environment where the ILEC and
11 only the ILEC had access to its facilities. This assumption is challenged by the concept of
12 collocation. Take central office space as an example. In its cost studies, BellSouth
13 identifies the land and buildings associated with its central office facilities and assigns all
14 such investment and associated costs to the various central office functions, services or
15 network elements. This results in the recovery of 100 percent of the central office related
16 land and building costs. Collocation charges, however, include a charge for central office
17 floor space, a charge which is apparently redundant.

18 **Q. WHAT IS YOUR CONCERN WITH REGARD TO SHARED COSTS OF**
19 **COLLOCATION?**

20 A. ILECs claim that they incur costs in preparing central office space for CLEC collocation.
21 Large portions of this cost are further claimed to be a fixed "space prep" cost, that is,
22 invariant with the number of CLECs that collocate. Typically, the first CLEC to collocate
23 agrees to reimburse the ILEC for these costs, subject to a provision that the ILEC will
24 recover a proportionate share of all these costs from subsequent collocators, and provide

1 this as a reimbursement to the first entrant. The difficulty is that reimbursements or
2 refunds have not always occurred. This behavior penalizes the first entrant, and can
3 reduce the willingness to be the first to collocate in a market area.

4 **Q. WHAT IS YOUR CONCERN WITH REGARD TO OVERHEAD COSTS?**

5 A. The Commission has issued orders limiting the markup for overhead costs. I would still
6 caution that if the markup were based upon dividing total overhead costs by total direct
7 costs, total direct costs included in that calculation may not recognize any collocation
8 activities. This is true where an extrapolation of past experiences is used in the
9 calculation. Where ever that is the case, there should be no overhead costs assigned to
10 the collocation activities.

11 **Q. WHAT ARE YOUR CONCERNS WITH RESPECT TO THE INCUMBENT'S**
12 **ABILITY TO FORCE CLECS TO TAKE UNWANTED ELEMENTS OR**
13 **SERVICES?**

14 A. As noted above, there is an incentive on the ILEC's part to increase the costs of
15 competing providers. One way to accomplish this is to create bundles that require CLECs
16 to take or duplicate unnecessary elements. Bundling in this manner can reduce the
17 incentive to enter a market, or at least make facilities based entry less attractive. CLECs
18 should not be discouraged from entering or from offering services using their own
19 equipment. The level of bundling and flexibility should be such that CLECs do not pay
20 unnecessary or uneconomic costs.²¹

²¹See also 706 Order (Advanced Services Order), ¶64.

1 Q. DO YOU HAVE ANY OTHER OBSERVATIONS WITH REGARD TO THE
2 ESTABLISHMENT OF CHARGES FOR COLLOCATION ACTIVITIES?

3 A. Yes. It must be recognized that while ILECs have been running cost studies and
4 presenting them to commissions for some time, it is only recently that they have
5 conducted cost studies for collocation (or non-recurring charges for unbundled network
6 elements, for that matter). What that means is there is no historic time series of data to
7 which the Commission can turn to judge the reasonableness of any rates proposed.
8 Hence, a benchmark of some type would be most helpful in evaluating the rates charged
9 by the ILEC in this regard.

10 Q. BASED ON THE ABOVE, WHAT IS YOUR RECOMMENDATION WITH
11 REGARD TO ESTABLISHING RATES AND CHARGES FOR
12 COLLOCATION?

13 A. In addition to the options recommended above, I suggest that the Commission establish a
14 two-pronged approach to pricing collocation. In the first, a collocation tariff, both
15 physical and virtual, must be established at TELRIC-based rates. Without an explicit
16 collocation tariff, including the rates and charges for each of the activities, each request
17 for collocation will be on an individual case basis ("ICB") which means that it will
18 require negotiation between the ILEC and CLEC. Clearly, the ILEC has all the
19 information, no incentive to facilitate its competitor's entry into the market, and therefore
20 can exercise its monopoly power in the negotiation process. This type of arrangement
21 could also result in frequent complaints to the Commission, increasing the demand on
22 Commission resources.

1 A. The procedures, methods and assumptions used were tailored to producing forward-
2 looking cost estimates of frame relay switching UNEs. My estimates employ efficient
3 technology. The frame relay switches selected reflect technologies being currently
4 deployed. Current market prices, adjusted for anticipated cost trends, were used for
5 equipment. The Expense Factors used in the study were generally those that have been
6 approved by the Commission for BellSouth. These factors are applied to the equipment
7 costs. The TELRIC results are shown in Exhibit__ (MHK-2).

8 Q. **WHAT ARE THE KEY COMPONENTS OF YOUR FRAME RELAY**
9 **TELRIC?**

10 A. There are four (4) basic steps to the study process:
11 1. Identify the forward-looking facility requirements;
12 2. Develop investment or first costs;
13 3. Calculate expenses: capital, operating, shared and common; and
14 4. Develop monthly costs.

15 Q. **HOW WERE FORWARD-LOOKING FACILITY REQUIREMENTS**
16 **DETERMINED?**

17 A. Facility requirements are determined based on an understanding of the equipment
18 involved and its uses. Facility requirements and costs were developed by Mr. Campbell
19 (as he describes in his testimony) with assistance from Intermedia and other industry and
20 vendor technical personnel.

21 Q. **HOW WERE INVESTMENT OR FIRST COSTS DEVELOPED?**

1 A. These costs were based on vendor prices for the facilities, plus installation costs. The
2 vendor prices for frame relay port cards were taken from the current price list and
3 adjusted to include hardware, generic software and other system related costs. These
4 costs were then adjusted to reflect anticipated discounts and inflation.

5 **Q. HOW ARE OTHER INVESTMENT RELATED COSTS ESTIMATED?**

6 A. Other investment related costs include installation and spare parts, or inventory.
7 Installation cost estimate is per Intermedia and ASCEND. This provides a facility that
8 has been engineered, furnished and installed. As a result, separate estimates for material,
9 TELCO and hardware are not necessary. The plug-in inventory estimate (spare parts) is
10 per the BellSouth study for digital switching systems. This is consistent with the
11 information provided by the industry for frame relay systems. No separate estimate for
12 support equipment or power was used, as that was included in the investment cost
13 identified above.

14 **Q. HOW WERE EXPENSES CALCULATED?**

15 A. Expenses were calculated using the BellSouth TFLRIC calculator methodology. To
16 calculate expenses, we first identified a set of expense factors from the Commission's
17 orders in prior TELRIC proceedings involving cost development. These factors were
18 then applied to the investment costs developed. Expense factors were obtained or
19 developed for capital, maintenance, other tax, shared and common expenses. The
20 expense factors developed by BellSouth were used, unless information specific to frame
21 relay was found to differ and be more appropriate.

1 **Capital costs** were developed utilizing the phi factor method incorporated into the
2 BellSouth TELRIC Calculator. We used a depreciation service life of five years, with no
3 net salvage value. Return and taxes were based upon the rates approved by the
4 Commission for use in preparing TELRIC estimates. Maintenance expense factor is that
5 developed by BellSouth for digital switching equipment. This factor produced
6 maintenance expense estimates on the high end of the range identified as reasonable by
7 members of the industry that we contacted. The ad valorem, gross receipts, shared and
8 common expense factors were also those approved by the Commission.

9 **Q. WHAT FILL FACTORS DID YOU APPLY TO THE FRAME RELAY**
10 **SWITCH?**

11 **A.** Two separate fill factors were used in this frame relay TELRIC analysis: a utilization rate
12 of slots and the utilization rate of ports on the cards that filled those slots.

13 The frame relay switch used as the basis of this analysis includes 16 slots. It is our
14 understanding that not all 16 can be used to hold port cards, as some are needed for a
15 variety of overhead functions. For purposes of the cost study, we assume that 12 slots of
16 the 16 available slots were used. This fill factor was part of the development of the
17 hardware and software cost factors used in establishing the adjusted list price and first
18 cost shown.

19 Not all ports on the cards included in the switch will be utilized at all times. We
20 used a 50 percent utilization rate for purposes of the cost study. The incorporation of this
21 utilization rate is shown at line 29 of the cost study.

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1 Q. **DO THESE PRICES ALLOW FOR A REASONABLE PROFIT?**

2 A. Yes. These prices include a profit at the Commission's approved cost of money.

3 Q. **DO THESE PRICES ALLOW FOR THE RECOVERY OF SHARED AND
4 COMMON COSTS?**

5 A. Yes. Shared and common costs are included in the TELRIC cost at the rate approved by
6 the Commission.

7 Q. **FOR WHAT UNES ARE YOU PROVIDING TELRIC ESTIMATES?**

8 A. At this time, I am providing TELRIC estimates for frame relay switch related UNEs, i.e.,
9 UNI and NNI ports. Intermedia will be seeking additional information from BellSouth
10 which will allow us to provide estimates for other frame relay TELRICs. When that
11 information has been received and analyzed, further TELRIC analysis and cost estimates
12 may be provided.

13 Q. **WHAT PRICES ARE YOU RECOMMENDING FOR THESE UNES?**

14 A. We are proposing that the prices be set at the TELRIC based costs shown in
15 Exhibit __ (MHK-2).
16

17 **VI. TERMINATION**

18 Q. **WHAT COSTS ARE TO BE RECOVERED THROUGH CHARGES FOR
19 TERMINATION AND TRANSPORT?**

20 A. The requirements for pricing interconnection services including termination and transport
21 are specified at Section 252(d)(2) of the Act. The Act specifies that prices for transport
22 and termination should be based on the costs of the carrier terminating the call that are

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1 associated with that function and that these costs should be the "additional costs" of
2 terminating such calls. From an economic perspective, the concept of additional cost
3 incurred by the carrier terminating the call refers to the incremental costs of the
4 termination and transport functions.

5 The FCC established rules are totally consistent with this economic interpretation.
6 The FCC identified the appropriate additional cost as the "forward looking, economic
7 cost,"²² of the service or element, including reasonable margins for profit and recovery of
8 joint and common costs. TELRIC would provide an appropriate measure of these costs.

9 **Q. DIDN'T THE FCC ESTABLISH A PRESUMPTION OF SYMMETRICAL**
10 **RATES BASED ON THE ILEC'S COSTS FOR TRANSPORT AND**
11 **TERMINATION?**

12 **A. Yes. However, the FCC concluded that if the costs of efficiently configured and operated**
13 **systems of competing local service providers justify a different rate, state commissions**
14 **could and should adopt rates that are not symmetrical.²³ Symmetrical compensation was**
15 **adopted as an interim measure for many reasons, not the least of which was because there**
16 **was not cost information for CLECs and, thus, no evidence at the time that costs were**
17 **other than symmetrical.²⁴ The Local Interconnection Order, however, clearly anticipated**
18 **that state commissions would review the symmetry presumption, and directed those state**

²²FCC First Report and Order, CC Docket No. 96-98, para. 1057. In regulatory terminology, these would be the "traffic sensitive" costs associated with the local network.

²³Local Interconnection Order, ¶¶1085-1089.

²⁴Ibid., ¶1089

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1 commissions to "give full and fair effect to the economic costing methodology" of the
2 Order when evaluating the cost studies of CLECs.

3 **Q. IS THERE REASON TO BELIEVE THAT THE COST FOR A CLEC TO**
4 **TERMINATE A CALL IS DIFFERENT THAN THE ILEC'S COST TO**
5 **PROVIDE THE SAME FUNCTION?**

6 A. Yes. First, CLECs tend to develop their network using a ring topology rather than the
7 pine tree topology used by the ILECs. A ring topology generally leads to a more traffic
8 sensitive network. In addition, newer and smaller entrants will not buy equipment
9 volumes, or provide the same diversity or scope of services as the ILEC. There is also
10 evidence of scale economies in switching systems.²⁵ Finally, a CLEC is likely to realize a
11 higher cost of capital than does the ILEC. These items could affect equipment costs and
12 expenses. Thus, there is reason to be concerned that the CLEC's unit costs may differ
13 from the ILEC.

14 **Q. HOW SHOULD THE COMMISSION, THEN, ESTABLISH THE RATES**
15 **PAID TO CLECS FOR PROVIDING CALL TERMINATION?**

16 A. The rates paid to CLECs for providing call termination should be based on the CLEC's
17 forward-looking costs. This is consistent with the economic policy objectives of the Act.

18 **Q. HAVE YOU PREPARED A TELRIC ESTIMATE OF THE CALL**
19 **TRANSPORT AND TERMINATION FUNCTION ON THE INTERMEDIA**
20 **NETWORK?**

²⁵See Further Notice of Proposed Rulemaking, Federal State Joint Board on Universal Service, CC
Docket No. 96-45, July 18, 1997.

1 A. A TELRIC estimate of Intermedia's call transport and termination function is in progress
2 and the results will be provided when the analysis has been completed. The TELRIC
3 methodology will be similar to that developed by BellSouth and will include three major
4 steps. First, facility requirements and investment cost estimates are identified; next,
5 expense factors will be developed; finally, the expenses will be calculated and summed.

6 **Q. HOW WILL INVESTMENT COSTS BE DETERMINED?**

7 A. We interviewed Intermedia personnel and other industry personnel to identify the
8 appropriate forward-looking technologies and facility requirements. The costs are based
9 on vendor prices for the facilities, plus installation costs. The vendor prices are taken
10 from the vendor's current price list and adjusted to include hardware, spare, generic
11 software and other system related costs. These costs will then be further adjusted to
12 reflect anticipated discounts and inflation.

13 **Q. HOW ARE EXPENSES TO BE CALCULATED?**

14 A. Expenses are being calculated using the BellSouth TELRIC calculator methodology. To
15 calculate expenses, we first identified a set of expense factors appropriate for Intermedia.
16 These factors were then applied to the investment costs developed. Expense factors were
17 obtained or developed for capital, maintenance, other tax, shared and common expenses.

18 Capital costs are developed utilizing the phi factor method incorporated into the
19 BellSouth TELRIC Calculator. Depreciation service life, cost of money and plant
20 specific expenses are based on factors reflecting Intermedia costs. Gross receipts, shared
21 and common expense factors, are those approved by the Commission.

22

Table 1

4-Wire Loop Cost-Based Price

TELRIC	\$6.45
Common Cost	.33
Cost-Based Price	\$6.78

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10 **Q. SHOULD THIS SAME METHOD BE APPLIED IN ESTIMATING THE**
11 **TELRIC FOR OTHER 4-WIRE UNE LOOPS?**

12 A. Yes. This methodology is applicable to other unbundled 4-wire loops.

13 **UNBUNDLING REQUESTS**

14 **Q. IS THE REQUEST FOR ADDITIONAL UNBUNDLED NETWORK**
15 **ELEMENTS CONSISTENT WITH THE ACT?**

16 A. Yes. As I explained, the Act selected entry as the vehicle to transform the market for
17 local services from one of regulated monopoly to one that is structurally competitive.
18 Intermedia is asking that network facilities that are in place and used by BellSouth be
19 made available as unbundled network elements. The elements include copper and fiber
20 loop facilities, subloop unbundling, high capacity transport facilities, xDSL and packet
21 switching facilities, among others. These requests are consistent with the open-entry
22 provisions of the Act.

1 **GEOGRAPHIC DEAVERAGING**

2 **Q. SHOULD THE COMMISSION MOVE TOWARD THE GEOGRAPHIC**
3 **DEAVERAGING OF RATES FOR UNBUNDLED ELEMENTS?**

4 **A.** It is Intermedia's position that the Commission should require the geographic
5 deaveraging of rates for unbundled network elements, where significant geographically
6 based cost differentials exist. Generally, one would expect that to be the case for the
7 various loop elements, though not necessarily with regard to other network elements.

8 The case for cost deaveraging of unbundled network elements rests on both
9 procompetitive and practical considerations. First, a primary goal in establishing prices
10 for unbundled network elements is to achieve a competitive market outcome. Price
11 signals to the market participants should promote efficient market entry and exit decisions
12 and efficient facility make/buy decisions. If efficient decision-making is to result, then
13 the prices charged must accurately reflect the underlying cost of the facilities in question.

14 Cost studies and engineering analysis point unquestionably to the fact that the cost of
15 providing unbundled loop elements will vary across geographic areas within most states.
16 This applies to 2-wire and 4-wire voice grade facilities, DSO and DS1 channels, and fiber
17 loop facilities (DS3, OC3, OC12, OC48 and Dark fiber). If efficient price signals are to
18 result, the cost calculation should reflect these differentials as should the resulting prices.
19 Hence, rates for unbundled loops should be geographically deaveraged.

1 Further, the FCC, in its decision with regard to the Ameritech-Michigan Section 271
2 Application, found that approval will rest on, among other things, cost based and
3 geographically deaveraged prices for unbundled loop elements (hence, the practical
4 reality of proposing geographically deaveraged rates).

5 **Q. WHAT ARE THE MATTERS THAT MUST BE CONSIDERED IN**
6 **ESTABLISHING GEOGRAPHICALLY DEAVERAGED RATES?**

7 A. If geographically deaveraged rates are to be established consist with the intent of the Act,
8 then the rates must be cost based. The structure of rates should be driven by cost
9 differences, not a LEC marketing strategy. This would suggest, for instance, that
10 geographically deaveraged rates could be based on wire centers, but not on exchanges.

11 TELRIC estimates are based on a "scorched node" model. This is the basis of the
12 BellSouth study and most other cost models (for instance, the HAI, BCPM and HCPM).
13 Using a wire center is therefore reasonable both from a policy as well as a practical
14 perspective. Exchanges, on the other hand, often include several wire centers. Where
15 this is the case, the exchange cost represents an average of the costs of the individual wire
16 centers. In that manner, cost differences are masked, and not allowed to serve as the basis
17 of geographically deaveraged rates.

18 Moreover, basing geographically deaveraged rates on exchanges can be
19 anticompetitive. There is no reason to require that CLECs establish calling areas

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1 comparable to the exchanges used by the ILEC, and there are no data to suggest that it is
2 efficient for CLECs to do so. Cellular carriers provide a case in point. Therefore, there is
3 no basis to use the calling area currently established by ILEC as the basis for
4 geographically deaveraged rates for elements taken by the CLEC. Using these exchanges
5 as the basis for geographically deaveraged rates will require the CLEC to mirror the
6 calling areas of the ILEC to take full advantage of pricing differentials. The implication
7 is clearly anticompetitive.

8 **Q. DOES THE BELLSOUTH TELRIC MODEL INCLUDE DATA ALLOWING**
9 **THE DETERMINATION OF COST BASED DEAVERAGED RATES?**

10 A. Yes. BellSouth used a sample of loops in estimating loop costs. This sample included
11 loops serving business and residence customers, loops of various lengths and located in
12 different density areas. These same data should be able to describe costs on a
13 geographically deaveraged basis. Complete data on the entire sample used by BellSouth
14 were not included with the filing in the generic cost proceeding. We are seeking these
15 data, and upon their receipt and review, geographically deaveraged costs based on the
16 BellSouth TELRIC will be presented.

17 **Q. ARE THERE ALTERNATIVE DATA SOURCES THAT THE COMMISSION**
18 **CAN RELY ON TO SET DEAVERAGED RATES?**

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1 A. Yes. There is a possibility that the BellSouth data will either not be available or not be
2 useful in estimating geographically differentiated loop costs. If that is the case, one
3 option is to rely on an alternative data source to deaverage the statewide rate. The
4 Hatfield 5.0 (HAI), BCPM 3.1, and FCC Hybrid Cost Proxy Model (HCPM) models can
5 be used in that manner. I present an illustration of cost based geographically deaveraged
6 rates using the HAI 5.0 model as the source of data for deaveraging in Table 2. To
7 determine these rates, I began with the statewide 2-wire voice grade unbundled loop rate
8 of \$17.00. This rate is for the loop including the NID, which is tariffed separately at
9 \$1.08. I applied the ratios to the rate for the loop less the NID (i.e., \$15.92) and then
10 added back the rate for the NID.

11

12

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Table 2			
Geographically Deaveraged			
	Cost Ratio	TELRIC	Percent of Loops
Statewide Average		\$17.00	
Zone 1	.701	\$12.24	42.0
Zone 2	1.004	\$17.06	44.8
Zone 3	1.802	\$20.77	13.2

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Q. **WHY DID YOU USE HAI 5.0 IN YOUR ILLUSTRATION?**

1 A. The HAI 5.0 data were readily available. Any of these other models could be used for
2 this purpose, however. As noted, we are seeking data from BellSouth which will allow a
3 deaveraging using that model. When these other data are available, we will be able to
4 provide comparable results using them as well.

5 **Q. HOW ARE THE DEAVERAGED RATES IN TABLE 2 DEVELOPED?**

6 A. Appreciating the policy issues involved in deaveraging rates, I limited the analysis to
7 three rate groups. Using HAI 5.0, I calculated the relative structure of these rates and
8 applied that to the Commission-approved statewide area rate. Switches with per line
9 costs below \$105 were included in Zone 1, between \$105 and \$160 were included in
10 Zone 2 and above \$160 in Zone 3.

11 **Q. ARE THERE OTHER DATA AVAILABLE THAT THE COMMISSION CAN**
12 **DRAW ON TO DEAVERAGE UNES?**

13 A. Yes. BellSouth has geographically deaveraged rates for interstate special access. These
14 rates are based on differences in density and could be used as the basis for geographically
15 deaveraged unbundled loop rates, as well.

16 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

17 A. Yes, it does.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Intermedia Communications,)
Inc. for Arbitration with BellSouth)
Telecommunications, Inc., pursuant to the)
Telecommunications Act of 1996)

**EXHIBITS ACCOMPANYING THE
REVISED DIRECT TESTIMONY OF DR. MARVIN H. KAHN**

ON BEHALF OF
INTERMEDIA COMMUNICATIONS, INC.

FEBRUARY 4, 1999

EXETER

Associates, Inc.

12510 Prosperity Drive
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MARVIN H. KAHN

Education:

B.A. Business Administration, 1965
Ohio Northern University

Ph.D. Economics, 1974
Washington University

Previous Employment:

- 1980-Present Senior Economist and Principal. Exeter Associates, Inc.
Silver Spring, MD
- 1977-1980 - Senior Economist, J.W. Wilson & Associates,
Inc., Washington, D.C.
- 1975-1977 - Economist, MITRE Corporation, McLean, Virginia,
Department of Energy Planning and Analysis.
- 1975 - Economist, Institute for Defense Analysis,
Arlington, Virginia, Program Analysis and
Evaluation, Cost Analysis Group.
- 1974 - Staff Economist, Ad Hoc Committee on the Domestic and International
Monetary Effect of Energy and Natural Resource Pricing, U.S. House of
Representatives, Committee on Banking and Currency, Washington, DC.
- 1969-1974 - Assistant Professor, Economics, University of Tennessee, Knoxville,
Tennessee.

Professional Work:

At J.W. Wilson & Associates, Inc., Dr. Kahn had the principal responsibility of developing and managing the firm's work dealing with analysis of the telecommunications industry. His efforts included basic and applied economic research into the cost of providing telecommunications services and market demand characteristics. He had lead responsibility in the firm's work involving cost of service, rate design, competition, and regulatory policy in telephony.

At the MITRE Corporation, Dr. Kahn directed much of the economic analysis into energy related issues. He was engaged in energy supply and demand analysis examining economic, life style, and growth implications of energy policies and issues; energy facilities siting issues; cost benefit analysis; and utility pricing policies. Particular efforts included econometric investigations of electricity demand, examinations of foreign peak load pricing experience, assessing the economic potential and effect of federal regulations on coal, nuclear and advanced electricity generation technologies, and examining the impact of energy conservation on electric utility growth, load factors and finances.

While at the Institute for Defense Analysis, Dr. Kahn was engaged in economic and cost analysis for the Office of Program Analysis and Evaluation, Office of Assistant Secretary of Defense. He developed an econometric model of manpower supply to naval and private shipyards.

At the Ad Hoc Committee, Dr. Kahn directed and assisted in preparation of committee studies on domestic and international effects of higher energy prices and analysis of energy legislation and policies. He served as the principal investigator in the study of energy price effects on domestic employment, production and price levels.

While serving on the faculty of the University of Tennessee, Dr. Kahn taught a variety of courses in economics including microeconomic, macroeconomic and labor market theory.

Selected Publications and Reports:

An Economic and Rate-making Assessment of Issues Regarding IntraLATA Competition for Telecommunications Services, Exeter Associates, Inc., September 1993.

The Pennsylvania Telecommunications Infrastructure, Exeter Associates, Inc., March 24, 1992, (Co-author).

Report on the Status of Intrastate Incentive Regulation in the United States, Exeter Associates, Inc., March 1992, (Co-author).

Market and Regulatory Effects of the Elimination of the Manufacturing Restriction on the Bell Operating Companies, Exeter Associates, Inc., November 1989, (Co-author).

Assessment of Issues Related to the MFJ Information Services Restrictions, Exeter Associates, Inc., November 1989, (Co-author).

An Analysis of the Open Network Architecture (ONA) Costing and Tariff Plans Filed by the Regional Bell Holding Companies, National Regulatory Research Institute, October 1988, (Co-author).

A Review and Evaluation of the Load Forecasts of Houston Light & Power Company and Central Power & Light Company: Past and Present. Exeter Associates, Inc., 1985. (Co-author).

Study of the Pricing Precedents in Public Utility Industries. Exeter Associates, Inc., November 1983. (Co-author).

Competition, Contribution and Cross Subsidy: An Examination of AT&T Costing and Pricing Procedures, Exeter Associates, Inc., August 1981.

Product and Market Diversification of Regulated Utilities: An Assessment of Competitive, Market and Regulatory Implications, Exeter Associates, Inc., May 1981.

A Study of Jurisdictional Separations to Compare AT&T's Interstate Settlements Information Systems with the Separations Manual and Division of Revenues Process. J.W. Wilson & Associates, Inc., September 1980. (Co-author).

Competition and Growth: An Economic Analysis of the Domestic Market for Private Branch Exchanges, J.W. Wilson & Associates, Inc., September 1978. (Co-author).

"Separations Analysis of New Jersey Bell Telephone Company," J.W. Wilson & Associates, Inc., July 1978.

"Conservation and Utility Pricing Policies," paper presented at Engineering Foundation Conference on Economic Impacts of Energy Conservation, sponsored by Committee on Science and Technology, U.S. House of Representatives, July 1978.

"An Economic Assessment of Market Potential for Advanced Intermediate and Peaking Electric Generating Technologies," MITRE Corporation, 1978. (Co-author).

Public Policy and Power Plant Siting, MITRE Corporation, March 1977.

Commercialization Case Study: The Light Water Reactor, MITRE Corporation, December 1976.

Fuel Choice vs. Fuel Use: An Economic Analysis of Residential Electricity Demand, MITRE Technical Report, 1976. Paper presented at NSF Workshop on Long Run Energy Demands, June 1976.

Long Run Energy Demands, MITRE Technical Report, 1976.

Electric Utility Financial Problems and Potential Solutions. MITRE Technical Report, April 1976.

Implications of Ownership Patterns on Financing and Development of Western Coal Resources.
MITRE Technical Report, May 1976.

"Some Short Run Dynamics of Residential Electricity Consumption." presented at the NSF Workshop on Electric Utility Financial Problems and Potential Solutions, August 1975.

Energy Security and the Domestic Economy: Impact on Prices, Employment and Consumption.
Ad Hoc Committee on the Domestic and International Monetary Effect of Energy and Natural Resource Pricing, 93rd Congress, 2nd Session, 1974.

"Layoff Behavior in Manufacturing Industries." (unpublished dissertation), Washington University, St. Louis, Missouri, 1974.

"The Homestead Provision: Its Costs and Those of Some Alternatives." unpublished working paper, Haney for Governor Committee, 1974.

"Extending the Tennessee Sales Tax: Estimates of its Revenue Potential, Distributional Effects, and Cyclical Sensitivity," unpublished working paper, Haney for Governor Committee, 1974.

Expert Testimony

Presented by Marvin H. Kahn

Before State Commissions:

Alabama Public Service Commission, Docket No. 17743; testified on separations and affiliated relations.

Alabama Public Service Commission, Docket No. 19983, testified on price cap regulation, local competition and universal service.

Alabama Public Service Commission, Docket No. 25625; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Alabama Public Service Commission, Docket No. 26029, testified on TELRIC estimates and pricing of unbundled network elements.

Alaska Public Utility Commission, Docket U-78-65; testified on cost of service and rate design of competitive service.

Arizona Corporation Commission, Docket No. E101-91-004; testified on telephone rate design.

Arizona Corporation Commission, Docket Nos. U-3021-96-448, U-3245-96-448, E-1051-96-448; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Arkansas Public Utility Commission, Docket 83-045-U; testified on access charges, impact of divestiture on revenue requirements and revenue sources, and rate design.

California Public Utilities Commission, Case No. 10001; testified on cost of service and rate design for Centrex service.

California Public Utilities Commission, Docket No. 93-04-003; testified on costing and pricing principles for unbundled network elements.

California Public Utilities Commission, Docket No. R 95-01-020; testified on discrimination and shared and common cost identification, and Universal Service Fund mechanics.

California Public Utilities Commission, Docket No. R 95-04-043; testified on pricing flexibility and local competition rules.

California Public Utilities Commission, Application No. 96-03-007; testified on regulatory policy for certification of a separate subsidiary under Section 272 of the Telecommunications Act of 1996.

California Public Service Commission, A.97-03-004; testified on rate reductions consistent with the PUC's competitively neutral mandate.

Colorado Public Utilities Commission, I&S Docket No. 1720; testified on utility rate design.

Delaware Public Service Commission, Docket No. 89-24T; testified on customer specific pricing of communication services.

Delaware Public Service Commission, Docket No. 91-35T; testified on pricing of Centrex services.

Delaware Public Service Commission, Docket No. 93-47; testified on Rate Design.

District of Columbia Public Service Commission, Formal Case No. 777; testified on telephone utility costs of service and rate design.

District of Columbia Public Service Commission, Formal Case No. 814, Phase III; competitive status of various services and cost support for pricing competitive services.

District of Columbia Public Service Commission, Formal Case No. 827; testified on rate design.

District of Columbia Public Service Commission, Formal Case No. 828; testified on regulatory principles and structure regarding competitive services.

District of Columbia Public Service Commission, Formal Case No. 828-II; testified on regulatory principles and structure regarding competitive services.

District of Columbia Public Service Commission, Formal Case No. 926; rate design.

Florida Public Service Commission, Docket No. 860984-TP; testified on market for interexchange services, pricing of access services and cost methodologies.

Florida Public Service Commission, Docket No. 880069-TL; testified on regulatory policy and depreciation practices.

Florida Public Service Commission, Docket No. 960916-TP; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Florida Public Service Commission, Docket No. 961537-TP; testified on local competition, unbundling network elements, TELRIC/TSLRIC, pricing

Georgia Public Service Commission, Docket No. 3765-U; testified on Centrex Costs and Pricing Policies.

Georgia Public Service Commission, Docket No. 3882-U; testified on Alternative Regulatory Structures.

Georgia Public Service Commission, Docket No. 3893-U; testified on Depreciation Policy.

Georgia Public Service Commission, Docket No. 3905-U; testified on incentive regulation.

Georgia Public Service Commission, Docket No. 3914-U; testified on EAS.

Georgia Public Service Commission, Docket No. 4018-U; testified on design and structure of an ONA policy.

Georgia Public Service Commission, Docket No. 4232-U; testified on N11 Service arrangements.

Georgia Public Service Commission, Docket No. 7061-U; testified on costs of unbundled network elements, competitive based markups.

Indiana Public Service Commission, Cause No. 35181; testified on telephone utility rate structures, unbundling of services and implications of FCC Registration Program.

Indiana Public Service Commission, Cause No. 36732; testified on telecommunication cost of services and rate design.

Illinois Commerce Commission, Docket No. 89-0033; testified on regulatory structure and policy and cost study methodology for competitive services.

Illinois Commerce Commission, Docket No. 92-0448; testified on regulatory structure and policy.

Illinois Commerce Commission, Docket No. 93-0319; testified on comparable service requirements to promote gas supply competition.

Kentucky Public Service Commission, Case No. 285; testified on LMS policy.

Kentucky Public Service Commission, Case No. 90-256; testified on telephone rate design.

Kentucky Public Service Commission, Case No. 10109; testified on regulatory policy, telephone productivity growth and price caps.

Kentucky Public Service Commission, Administrative Case No. 323; testified on intraLATA toll competition.

Kentucky Public Service Commission, Case No. 92-297; testified on competitive and ratemaking implications of an extended area service policy.

Kentucky Public Service Commission, Case No. 94-121; testified on appropriate method of regulation.

Kentucky Public Service Commission, Case No. 355; testified on local competition rules.

Kentucky Public Service Commission, Case No. 96-467; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Kentucky Public Service Commission, Case No. 97-074; testified on rate restructuring implications of rebundling network elements.

Louisiana Public Service Commission Docket No. U-17949-(A); testified on negative attrition and alternative regulatory structures.

Louisiana Public Service Commission, Docket No. U-17949-(B); testified on toll competition issues.

Louisiana Public Service Commission, Docket No. U-17949-(D); testified on alternative regulatory structures.

Louisiana Public Service Commission, Docket No. U-17949-(E); testified on total factor productivity, economic depreciation, and an economic analysis of construction programs.

Louisiana Public Service Commission, Docket No. U-17957; testified on AOS policy.

Louisiana Public Service Commission, Docket No. U-18976; testified on cellular service.

Louisiana Public Service Commission, Docket No. U-20710; testified on competitive service pricing.

Louisiana Public Service Commission, Docket No. U-20925; testified on alternative regulatory structures.

Louisiana Public Service Commission, Docket No. U-22020; testified on avoided cost discounts.

Louisiana Public Service Commission, Docket No. U-22022, 22093; testified on costs of unbundled network elements, competitive based markups.

Maine Public Utilities Commission, Docket No. 92-345, Phase I; testified on regulatory policy and structure, and incentive regulation.

Maine Public Utilities Commission, Docket No. 92-345, Phase II; testified on Staff Plan for alternative regulation for Central Maine Power.

Maryland Public Service Commission, Case No. 7435; testified on affiliated relations and utility rate design.

Maryland Public Service Commission, Case No. 7467; testified on jurisdictional separations.

Maryland Public Service Commission, Case No. 7788; testified on the regulatory principles and structure regarding interexchange communications carriers.

Maryland Public Service Commission, Case No. 7851; testified on telephone utility rate design.

Maryland Public Service Commission, Case No. 7902; testified on category cost of service study methodologies.

Maryland Public Service Commission, Case No. 8763; testified on the application of the New Services Test to private coin services.

Massachusetts Department of Public Utilities, DPU No. 19843; testified on affiliated relations, Western Electric pricing.

Michigan Public Service Commission, Case No. U-5197, et al.; testified on Western Electric costs and pricing.

Michigan Public Service Commission, Case No. U-6002; testified on separations.

Mississippi Public Service Commission, Docket No. 97-AD-544; TELRIC and pricing standards.

Nevada Public Service Commission, Docket No. 91-7026; testified on rate design.

New Mexico Public Service Commission, Case No. 96-307-TC; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

New York Public Service Commission, Case No. 27710-27995; testified on costs and rates of local coin service.

New York Public Service Commission, Case No. 27995; testified on category costs of service utility rate design and deregulation.

New York Public Service Commission, Case No. 28264; testified on category costs of service, costs of local service, and design and structure of local exchange rates.

New York Public Service Commission, Case No. 29469; testified on competition and regulation of cellular services.

Ohio Public Utilities Commission, Case No. 79-1184-TP-AIR; testified on rate design and rate structure.

Ohio Public Utilities Commission, Case No. 83-300-TP-AIR; testified on rate design and rate structure.

Ohio Public Utilities Commission, Case No. 83-464-TP-COI; testified on regulatory structure and access charges.

Ohio Public Utilities Commission, Case No. 84-435-TP-AIR; prepared analysis of rate design.

Pennsylvania Public Utility Commission, R.I.D. No. 289, et al.; testified on utility cost of service methodologies and rate design for competitive telecommunications service offerings.

Pennsylvania Public Utility Commission, Docket R-811512; provided telephone utility cost of service study, testified on rate design.

Pennsylvania Public Utility Commission, Docket R-811819; testified on telephone utility cost of service and rate structure.

Pennsylvania Public Utility Commission, Docket R-832316; testified on access charges, impact of divestiture on revenue requirements and revenue sources, and rate design.

Pennsylvania Public Utility Commission, Docket No. P-830452; testified on the impacts of divestiture on operating company operations and carrier access charges.

Pennsylvania Public Utility Commission, Docket No. R-842779; testified on telephone rate design and stand alone costing procedures.

Pennsylvania Public Utility Commission, Docket No. R-850044; testified on telephone rate design.

Pennsylvania Public Utility Commission, Docket No. R-850170; testified on policy issues regarding public, semipublic and privately owned coin stations and services.

Pennsylvania Public Utility Commission, Docket No. R-850229; testified on rate design.

Pennsylvania Public Utility Commission, Docket No. 860923; rate design and depreciation practices.

Pennsylvania Public Utility Commission, Docket No. R-930715; testified on regulatory structure, productivity growth and utility costs.

Pennsylvania Public Utility Commission, Docket No. 940587; testified on total service long run costs and revenue-cost comparisons of competitive services.

Pennsylvania Public Utility Commission, Docket No. 951005; testified on alternative regulatory structures for small telephone companies.

Pennsylvania Public Utility Commission, Docket No. 963556; testified on rate design for services and network elements.

Pennsylvania Public Utility Commission, Docket No. R-00951005; testified on alternative regulatory structures, total factor productivity, price cap plans.

Pennsylvania Public Utility Commission, Docket No. R-00963534; testified on rate rebalancing in the context of a price cap plan.

Pennsylvania Public Utility Commission, Docket No. A-310203F0002(III), et al.; testified on local competition, TELRIC/TSRJC pricing of unbundled network elements.

Pennsylvania Public Utility Commission, Docket No. I-00960066; testified on issues related to access charge rate structure and universal service policies.

Rhode Island Public Utilities Commission, Docket No. 1475; testified on rate design and rate structure.

Rhode Island Public Utilities Commission, Docket 1631 (Phase I); testified on revenue requirements and merits of company cost of service studies.

Rhode Island Public Utilities Commission, Docket 1631 (Phase II); provided telephone utility cost of service study.

Rhode Island Utilities Commission, Dockets 1560R, 1631, and 1654; testified on utility cost of service and rate design.

Rhode Island Public Utilities Commission, Docket 1687; testified on rate design and structure of local and toll rates.

Rhode Island Public Utilities Commission, Docket 1698; testified on rate design.

Rhode Island Public Utilities Commission. Docket 1878; testified on rate design.

South Carolina Public Service Commission. Docket 79-305-C; testified on cost of service, rate design, separations and affiliated relationships.

South Carolina Public Service Commission. Docket 82-291-C; testified on telephone utility cost of service methodologies and rate structure.

South Carolina Public Service Commission. Docket No. 97-374-C; testified on costs of unbundled network elements, competitive based markups.

Tennessee Regulatory Authority, Docket No. 96-01331; testified on avoided cost discount.

Texas Public Utility Commission, Docket No. 8585; testified on cost study methodology and the pricing of competitive services.

Texas Public Utility Commission, Docket Nos. 16189, 16196, 16226, 16285, 16290; testified on the application of TSLRIC/TELRIC principles in the pricing of unbundled network elements.

Texas Public Utility Commission, Docket No. 16473; testified on local competition, unbundling network elements, TELRIC/TSLRIC, pricing.

Utah Public Service Commission, Docket No. 94-999-01, Phase III; testified on pricing of unbundled network elements, colocation services and interim number portability.

Virginia Corporation Commission, Docket PUC 920029; testified on incentive regulation, utility productivity, utility construction programs.

Virginia Corporation Commission, Docket PUC 930039; testified on productivity growth, construction programs and incentive regulatory plans.

Washington Utilities and Transportation Commission. Case No. U-75-54; testified on cost of service methodologies for competitive telecommunications service offerings.

Washington Utilities and Transportation Commission. Cause Nos. U-86-34, et al.; testified on the establishment of rules and procedures regarding the detariffing of utility products and services.

West Virginia Public Service Commission. Case No. 84-747-T-42T; testified on rate design, access charge structures and affiliated relationships.

West Virginia Public Service Commission, Case No. 85-282-T-GI; testified on the policy of interexchangeable competition.

West Virginia Public Service Commission. Case Nos. 85-490-T-P, et al.; testified on access charge structures.

West Virginia Public Service Commission. Case Nos. 86-038-T-C, et al. testified in complaint case regarding independent telephone company earnings.

West Virginia Public Service Commission. Case No. 86-364-T-GI; testified on access charge structures.

West Virginia Public Service Commission: Case No. 89-206-T-42T; Telephone Rate Design and Local Calling Plans.

West Virginia Public Service Commission: Case No. 90-522-T-42T. Telephone Rate Design and Local Calling Plans.

West Virginia Public Service Commission. Case No. 94-1103-T-GI; testified on total service long run incremental costs and local service competition.

Wisconsin Public Service Commission, Docket No. 6720-TI-103; testified on cost standards for competitive services and compensatory pricing of Centrex service.

Wisconsin Public Service Commission, Docket No. 6720-TI-102; testified on productivity and rate implications of rate moratorium.

Wisconsin Public Service Commission, Docket No. 6720-TR-104; testified on incentive regulation proposals.

Before the Federal Energy Regulatory Commission (FERC):

Natural Gas Pipeline Company of America. Docket No. 87-141; filed testimony on the GIC.

Tennessee Gas Pipeline Company, Docket No. RP-88-228-000 et. al.; filed testimony on comparable service.

Before Canadian Commissions:

Prince Edward Island Public Utilities Commission, complaint case; testified on cost of service and rate design for PBX equipment, and the economic implications of interconnection.

Before U.S. Postal Commission:

Docket MC79-3; testified on cost of service and rate design for second-class mail.

Before Legislatures:

Committee on Commerce, U.S. Senate, Subcommittee on Communications; expert witness testifying for Subcommittee Staff on U.S. Department of Transportation Study on Impacts of Daylight Savings Time Act.

Committee on Banking and Currency, U.S. House of Representatives, Ad Hoc Committee on the Domestic and International Monetary Effect of Energy and Natural Resource Pricing; appeared as Staff witness on inflationary and unemployment effects of the oil embargo, and on utility pricing policy proposals.

Committee on Consumer Affairs, Pennsylvania House of Representatives, appeared on behalf of the Office of Consumer Advocate, testified on regulatory policy regarding telecommunications.

Other:

District Court of Lancaster County, Nebraska, in Re: Norstan Communications vs. State of Nebraska, Docket No. 355; testified on the market for telecommunications services and the effect of emerging competition.

U.S. District Court for the District of Columbia, in RE: US. vs. AT&T et. al., C.A. No. 74-1698; testified on Western Electric PBX Pricing.

U.S. District Court for the Southern District of Florida, in Re: Eugene Steele d/b/a Yacht Buyers Group vs. Morgan Yacht, et al., Case No. 82-2757-CIU-JE; testified on economic estimate of damages.

U.S. District Court for the District of Maryland, in Re: Fred Menke's Car Store, Inc. and Fred R. Menke, Sr. vs. Volvo North America Corporation, C.A. No. H86-1150; testified on economic estimate of damages.

U.S. District Court for the Eastern District of Pennsylvania, in Re: Design Sales Associates, Inc. vs. Pittcon Industries, Inc., C.A. No. 87-0805; testified on economic estimate of damages.

BellSouth Florida
Frame Relay Switch TELRIC
56/64 Kbps Port

		56/64 Kbps Channelized T-1				
	<u>Factor</u>	<u>Port Cards</u>	<u>Factor</u>	<u>Buildings</u>	<u>Factor</u>	<u>Land</u>
1	List Price of card	\$7,500.00		\$1,559.07		\$106.38
2	Hardware cost	0.3175	2380.95	0.0000	0.00	0.00
3	Software cost	0.2698	2023.81	0.0000	0.00	0.00
4	Inflation adjustment	-0.1000	(1190.48)	0.0405	63.14	4.31
5	Vendor discount	-0.3500	(3750.00)	0.0000	0.00	0.00
6	Subtotal list price		\$6,964.29		\$1,622.22	\$110.69
7	Installation		4000.00		0.00	0.00
8	Plug-in Inventory	0.0681	474.27	0.0000	0.00	0.00
9	Material	0.0000	0.00	0.0000	0.00	0.00
10	TELCO	0.0000	0.00	0.0000	0.00	0.00
11	Plug-in	0.0000	0.00	0.0000	0.00	0.00
12	Hardwired	0.0000	0.00	0.0000	0.00	0.00
13	Support Equipment & Power	0.0000	0.00	0.0000	0.00	0.00
14	Subtotal first cost		\$11,438.55		\$1,622.22	\$110.69
15	Pole loading	0.0000	0.00	0.0000	0.00	0.00
16	Conduit loading	0.0000	0.00	0.0000	0.00	0.00
17	Depreciation	0.2000	2287.71	0.0213	34.61	0.0000
18	COM	0.0631	722.05	0.0791	128.32	0.099
19	Income Tax	0.0289	330.63	0.0362	58.76	0.0453
20	Maintenance	0.0400	457.54	0.0053	8.60	0.0000
21	Ad Valorem	0.0120	137.26	0.0120	19.47	1.33
22	Direct Costs		\$3,935.19		\$249.75	\$17.30
23	Shared Costs	0.0376	430.09	0.0000	0.00	0.00
24	Gross Receipts Tax	0.0153	66.79	0.0153	3.82	0.26
25	Common Cost	0.0512	226.92	0.0512	12.98	0.90
26	Annual Cost		\$4,658.99		\$266.55	\$18.47
27	Monthly cost		\$388.25		\$22.21	\$1.54
28	Per port cost (4 ports/card)		\$97.06		\$5.55	\$0.38
29	Utilization rate	0.5000	\$194.12		\$11.11	\$0.77

TOTAL COST	\$206.00
(incl. land and building)	

BellSouth Florida
Frame Relay Switch TELRIC
1.536 Mbps Port

		1.536 Mbps using DSX-1				
	<u>Factor</u>	<u>Port Cards</u>	<u>Factor</u>	<u>Buildings</u>	<u>Factor</u>	<u>Land</u>
1	List Price of card		\$9,775.00		\$1,731.43	\$118.14
2	Hardware cost	0.3175	2785.71	0.0000	0.00	0.00
3	Software cost	0.2698	2367.86	0.0000	0.00	0.00
4	Inflation adjustment	-0.1000	(1392.86)	0.0405	70.12	4.78
5	Vendor discount	-0.3500	(4387.50)	0.0000	0.00	0.00
6	Subtotal list price		\$8,148.21		\$1,801.56	\$122.92
7	Installation		4000.00		0.00	0.00
8	Plug-in Inventory	0.0681	554.89	0.0000	0.00	0.00
9	Material	0.0000	0.00	0.0000	0.00	0.00
10	TELCO	0.0000	0.00	0.0000	0.00	0.00
11	Plug-in	0.0000	0.00	0.0000	0.00	0.00
12	Hardwired	0.0000	0.00	0.0000	0.00	0.00
13	Support Equipment & Power	0.0000	0.00	0.0000	0.00	0.00
14	Subtotal first cost		\$12,703.11		\$1,801.56	\$122.92
15	Pole loading	0.0000	0.00	0.0000	0.00	0.00
16	Conduit loading	0.0000	0.00	0.0000	0.00	0.00
17	Depreciation	0.2000	2540.62	0.0213	38.43	0.00
18	COM	0.0631	801.87	0.0791	142.51	12.17
19	Income Tax	0.0289	367.18	0.0362	65.25	5.57
20	Maintenance	0.0400	508.12	0.0053	9.55	0.00
21	Ad Valorem	0.0120	152.44	0.0120	21.62	1.48
22	Direct Costs		\$4,370.23		\$277.36	\$19.22
23	Shared Costs	0.0376	477.64	0.0000	0.00	0.00
24	Gross Receipts Tax	0.0153	74.17	0.0153	4.24	0.29
25	Common Cost	0.0512	252.01	0.0512	14.42	1.00
26	Annual Cost		\$5,174.05		\$296.02	\$20.51
27	Monthly cost		\$431.17		\$24.67	\$1.71
28	Per port cost (10ports/card)		\$43.12		\$2.47	\$0.17
29	Utilization rate	0.5000	\$86.23		\$4.93	\$0.34

TOTAL COST	\$91.51
(incl. land and building)	

BellSouth Florida
Frame Relay Switch TELRIC
44.210 Mbps Port

		44.210 Mbps using HSS1				
	<u>Factor</u>	<u>Port Cards</u>	<u>Factor</u>	<u>Buildings</u>	<u>Factor</u>	<u>Land</u>
1	List Price of card	\$5,400.00		\$1,275.19		\$87.01
2	Hardware cost	0.3175	1714.29	0.0000	0.00	0.00
3	Software cost	0.2698	1457.14	0.0000	0.00	0.00
4	Inflation adjustment	-0.1000	(857.14)	0.0405	51.65	3.52
5	Vendor discount	-0.3500	(2700.00)	0.0000	0.00	0.00
6	Subtotal list price		\$5,014.29		\$1,326.84	\$90.53
7	Installation		4000.00		0.00	0.00
8	Plug-in Inventory	0.0681	341.47	0.0000	0.00	0.00
9	Material	0.0000	0.00	0.0000	0.00	0.00
10	TELCO	0.0000	0.00	0.0000	0.00	0.00
11	Plug-in	0.0000	0.00	0.0000	0.00	0.00
12	Hardwired	0.0000	0.00	0.0000	0.00	0.00
13	Support Equipment & Power	0.0000	0.00	0.0000	0.00	0.00
14	Subtotal first cost		\$9,355.76		\$1,326.84	\$90.53
15	Pole loading	0.0000	0.00	0.0000	0.00	0.00
16	Conduit loading	0.0000	0.00	0.0000	0.00	0.00
17	Depreciation	0.2000	1871.15	0.0213	28.31	0.00
18	COM	0.0631	590.57	0.0791	104.96	8.96
19	Income Tax	0.0289	270.42	0.0362	48.06	4.10
20	Maintenance	0.0400	374.23	0.0053	7.03	0.00
21	Ad Valorem	0.0120	112.27	0.0120	15.92	1.09
22	Direct Costs		\$3,218.65		\$204.27	\$14.15
23	Shared Costs	0.0376	351.78	0.0000	0.00	0.00
24	Gross Receipts Tax	0.0153	54.63	0.0153	3.13	0.22
25	Common Cost	0.0512	185.60	0.0512	10.62	0.74
26	Annual Cost		\$3,810.65		\$218.02	\$15.11
27	Monthly cost		\$317.55		\$18.17	\$1.26
28	Per port cost (2ports/card)		\$158.78		\$9.08	\$0.63
29	Utilization rate	0.5000	\$317.55		\$18.17	\$1.26

TOTAL COST	\$336.98
(incl. land and building)	

BellSouth
Frame Relay Switch TELRIC

Notes:

Lines 1-3: Per R. Campbell and Intermedia.

Lines 4-5: Exeter estimate.

Line 7: Ascend estimate. Installation estimate eliminates need for costs included by BellSouth in lines 9-13.

Line 16: Depreciation service life assumed to be 5 years, with zero net salvage

Lines 17-20, 22-24: Per BellSouth TELRIC calculator and PSC order

Line 29: Exeter estimate.

Land and Building investments and factors: Per BellSouth TELRIC calculator and PSC order.

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a copy of the foregoing has been furnished by U.S. Mail or hand delivery (*) this 4th day of February, 1999, to the following:

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c/o Ms. Nancy H. Sims
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