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September 10, 1996

Ms. Blanca S. Bayo, Director
Division of Records & Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0850

Re: Docket No. 960847-TP
Petition by AT&T Communications of the Southern States, Inc. for arbitration of certain terms and conditions of a proposed agreement with GTE Florida Incorporated concerning interconnection and resale under the Telecommunications Act of 1996

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Dear Ms. Bayo:

Please find enclosed for filing an original and fifteen copies of GTE Florida Incorporated's Response to AT&T Communications of the Southern States, Inc.'s Petition for Arbitration in the above matter. This response is made in three binders. The first binder is referred to as GTE's Response to AT&T's Petition. It includes GTE's pre-arbitration brief and associated materials (GTE's Takings Report and issues matrix) and GTE's testimony. The second binder includes additional background information, including GTE's proposed interconnection, resale and unbundling agreement. The third binder contains confidential cost study material. These cost study materials are not to be publicly filed or disclosed. They are being provided subject to GTE's Notice of Intent to Seek Confidential Classification, which is being filed under separate cover.

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Service has been made as indicated on the Certificate of Service. If there are any questions regarding this matter, please contact me at (813) 228-3087.

Very truly yours,

Anthony P. Gillman

APG:tas
Enclosures

**CERTIFICATE OF SERVICE**

I HEREBY CERTIFY that copies of GTE Florida Incorporated's Response to AT&T Communications of the Southern States, Inc.'s Petition for Arbitration in Docket No. 960847-TP were hand-delivered on September 10, 1996 to the parties listed below.

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# Public Service Commission

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## ***Docket No. :*** 960847-TP

## ***Docket Title:*** Petition by AT&T Communications of the Southern States, Inc. for arbitration of certain terms and conditions of a proposed agreement with GTE Florida Incorporated concerning interconnection and resale under the Telecommunications Act of 1996.

***DN 09615-96***

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960847-TP

AEW-1 (part of 09615-96)

Docket No. 960847-TP
Direct Testimony of Albert E. Wood, Jr.
Exhibit No. AEW-1
FPSC Exhibit No. _____

(part of 09615-96)

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# GTE's Response

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Response

# GTE's Response

**BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| In re: Petition by AT&T Communications of the Southern States, Inc. for Arbitration of Certain Terms and Conditions of a Proposed Agreement with GTE Florida Incorporated Concerning Interconnection and Resale under the Telecommunications Act of 1996 | ) | Docket No. 960847-TP<br>Filed: September 10, 1996 |

# ARBITRATION BRIEF OF GTE FLORIDA INCORPORATED

## Introduction

The Telecommunications Act of 1996 (the "Act") held out great promise to usher in an era of facilities-based competition in the local exchange telephone market. To accomplish this end, Congress required incumbent local exchange carriers ("ILECs"), like GTE, to open up their networks to competitors by mandating interconnection, unbundling of the network, and the sale of retail services at wholesale prices. Rather than imposing prices from the federal level, Congress opted for market-based pricing by establishing a negotiation process between the parties. As a backstop, Congress chose the States (through their public utility commissions) to discipline the negotiation process by establishing prices for local service through State-sponsored arbitrations when the parties cannot voluntarily reach agreement. Congress was concerned, however, not only with ensuring access to the local network but also with ensuring that ILECs recover their costs and earn a reasonable profit on their investments. In short, the Act is all about fostering competition -- not protecting competitors.

Contrary to the mandate of Congress, the Federal Communications Commission ("FCC"), in its First Report and Order,[1] broke with every major principle underlying the Act. In violation of Section 2(b) of the Communications Act, the FCC has attempted to strip the States of their rightful role in establishing local telephone rates for intra-State service by establishing elaborate pricing methodologies and default proxy rates. In violation of the Act and the Constitution's prohibition against an uncompensated taking of GTE's property, the FCC's pricing rules and default rates ensure that ILECs will not recover all of their forward-looking costs or historic costs of the network. Likewise, the FCC has resolved countless other issues concerning unbundling, resale, and interconnection in a way that favors competitors -- not competition.

AT&T's position in this arbitration on every major issue takes advantage of each mistake committed by the FCC.[2] AT&T proposes rates that would force GTE to sell its services at below cost, and AT&T would have this Commission impose flawed, unjustified, and unlawful default proxy rates that would effect an uncompensated unconstitutional taking of GTE's property. Rather than impose those rates, the Commission should join the growing number of States challenging the FCC's authority

---

[1] In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket No. 96-98, FCC 96-325 (released August 8, 1996) ("First Report And Order").

[2] See AT&T's Petition For Arbitration Under the Telecommunications Act of 1996 filed against GTE Florida (filed August 16, 1996) ("AT&T Petition").

to have imposed those rates in the first instance.[3] There can be no question either that the FCC's price rules, if followed, would compel GTE to subsidize the entry of AT&T -- the nation's fifth largest company (and largest telecommunications company) with over $70 billion of annual revenue -- into the local telephone market. Whatever economic theory it is that leads to that result, it is not "competition" and not envisioned by the Act.

The heart of this case -- and the principal task of this Commission -- is to establish a framework for promoting full and fair competition in the local exchange market while at the same time ensuring that consumers receive the benefits of competition. In simple terms, the Commission must resolve the disputed issues in such a way as to promote competition, not the self-serving interests of a particular competitor.[4]

The Commission cannot achieve this goal unless it adopts a pricing methodology that encourages efficient entry into the telecommunications market, encourages facilities-based competition, and sends pricing signals that will maximize consumer welfare by maximizing consumer choice. To this end, GTE urges the Commission to adopt its pricing methodology -- the Market-Determined Efficient

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[3] Florida, as well as a number of other states, are expected to file appeals of the FCC's first Report and Order. The Florida Commission also intends to seek a stay of that Order.

[4] While pricing and costing are the main issues raised by this arbitration, there are numerous other related issues that still remain open between the parties. To assist the Commission in resolving those open issues, we have included in our Response a comprehensive matrix of all those issues between AT&T and GTE nationwide. Attached to this brief is a "slimmed down" version of that matrix addressing the 40 or so open issues in this proceeding.

Component Pricing Rule ("M-ECPR") -- which will achieve all the Commission's goals. As explained in more detail in Report VIII and below in Parts II-III, M-ECPR is a market-based method for determining GTE's share of forward-looking joint and common costs that should be allocated to prices for its unbundled network elements. This model does not permit GTE to charge a price for an unbundled element that exceeds the market price. With respect to resold services, M-ECPR similarly derives a price that reflects GTE's costs of providing those services. Notably, M-ECPR is not a "make-whole" remedy.

This brief begins with an overview of the many reasons why the Commission should not, and need not, follow the FCC's wrongheaded approach to the Telecommunications Act of 1996. (See Part I below.) Next, we address the principal issue of this arbitration -- establishing the costing and pricing for unbundled network elements and resold services in such a way that will allow GTE to recover its costs. (Parts II-III.) In addition, we focus on a number of other cost-recovery issues, in which AT&T (once again) is trying to have GTE pay for its entry into and participation in the market; here, it is by having GTE pick up the cost of reconfiguring its own network in order to comply with AT&T's interconnection requests. (Part IV.) Finally, we address the FCC's and AT&T's overly broad definition of what is technically feasible, which is untethered to real-world concerns (like cost, space, time etc.). (Part V.) If AT&T's position were adopted, then GTE would be forced to underwrite yet another cost of AT&T's market entry.

## Discussion

### I. THE COMMISSION IS NOT BOUND BY AND SHOULD NOT FOLLOW THE FCC'S PRICING METHODOLOGIES OR DEFAULT PROXY RATES.

#### A. Introduction.

AT&T's request for the Commission to adopt the FCC's pricing rules and default proxy rates should be rejected for at least three reasons: (1) the FCC exceeded its authority under the Act by mandating certain pricing methodologies and by preempting States from considering other methodologies; (2) the FCC's default rates are flawed and based on erroneous assumptions; and (3) the FCC's pricing methodologies and default rates, if adopted, would result in a taking of GTE's property without just compensation in violation of the Fifth and Fourteenth Amendments, because these price rules and default rates would set prices that are substantially below GTE's actual costs. We address each of these reasons below (Parts I.C-E). First, however, to put AT&T's default proxy rate gambit into perspective, we begin with an overview of AT&T's strategy to "game" this entire arbitration process to its advantage.

#### B. AT&T's Gaming Strategy.

In almost all States, AT&T is using every contrivance to avoid a hearing on the merits in order to force the State commissions to adopt the FCC's unlawful default rates. AT&T's strategy is transparent: (1) assert that the State commission cannot evaluate the requisite cost studies and other materials before the deadline set forth in the Act; (2) attempt to force the FCC's default rates upon GTE without the benefit of a hearing on the merits; and (3) delay a hearing on the merits to keep the default rates in

effect as long as possible. This strategy is risk-free for AT&T, because there is no "true-up" mechanism under which AT&T would compensate GTE for its immediate monetary losses incurred while the default rates are in effect. Even if there were such a mechanism, GTE would still suffer irreparable harm because it could never be made whole for its loss of market share incurred during the period in which the default rates were effective.

Quite incredibly, AT&T's claim that the Commission should impose default rates flatly contradicts the claims AT&T made to the FCC on this very issue less than four months ago. In its Notice of Proposed Rulemaking in CC Docket No. 96-98 (the "NOPR"), the FCC asked parties to comment on whether it should establish default or "proxy" rates:

> We also seek comments on the benefits, if any, of adopting a national policy of outer boundaries for reasonable rates instead of specifying a particular pricing methodology.

FCC NOPR at ¶ 134. In responding to the FCC's request for comments, AT&T argued forcefully -- and with a full understanding of the procedural deadlines prescribed in the Act -- that the FCC should ***not*** adopt default proxy rates:

> The [FCC] also seeks comments on "the benefits, if any" of specifying generic rate ceilings based on some existing tool or methodology other than TSLRIC. The costs to competition and consumer welfare would far outweigh any benefits of that approach. First, ***given the present ability of parties and state arbitrators to estimate directly and manageably the relevant TSLRICs, there is little to be gained by adopting an economic cost "surrogate" or "proxy".***

See Comments of AT&T Corp. at 52, CC Docket No. 96-98 (filed May 16, 1996) (emphasis added).

AT&T's about-face on the use of proxy rates is stark evidence of AT&T's gaming strategy. AT&T undoubtedly knows that the proxy rates manufactured by the FCC are well below the just and reasonable rates required under the Act, and therefore is trying to force these rates upon GTE and other incumbent local exchange carriers for as long as possible.[5]

**C. The FCC Exceeded Its Authority By Usurping The Commission's Power.**

AT&T is requesting interconnection, services, and unbundled elements under § 251(c) of the Act. The prices for these facilities and services are subject to the pricing standards set forth in § 252(d)(1)-(3). The Act expressly provides that the State commissions have exclusive authority to establish and apply these standards:

> ***(d) Pricing Standards.***
>
> (1) Interconnection and network element charges. Determinations by a ***State commission*** of the just and reasonable rate for the interconnection of facilities and equipment for purposes of subsection (c)(2) of section 251, and the just and reasonable rate

---

[5] AT&T's scheme should also be rejected because it attempts to short-circuit the arbitration process by preventing GTE from introducing evidence before rates are established. The Constitution, however, prohibits this scheme. See, e.g., Goldberg v. Kelly, 397 U.S. 254, 269 (1970) ("[i]n almost every setting where important decisions turn on questions of fact, due process requires an opportunity to confront and cross-examine adverse witnesses"); Bryant v. Arkansas Public Service Commission, 877 S.W.2d 594, 600-01 (Ark. App. 1994) ("a fundamental requirement of due process in matters of public utility regulation is a full and fair hearing, and a basic element of a full and fair hearing is that all those whose rights are involved have the opportunity to be heard, to submit evidence and testimony, to examine witnesses and present evidence or testimony in rebuttal to adverse positions").

for network elements for purposes of subsection (c)(3) of such section --

* * *

(2) Charges for transport and termination of traffic.

(A) In general. For the purposes of compliance by an incumbent local exchange carrier with section 251(b)(5), a ***State commission*** shall not consider the terms and conditions for reciprocal compensation to be just and reasonable unless --

* * *

(3) Wholesale prices for telecommunications services. For the purposes of section 251(c)(4), a ***State commission*** shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier.

47 U.S.C. § 252(d)(1)-(3) (emphases added).

Congress' Section 251(d) mandate that State commissions alone are authorized to set prices is confirmed by Section 2(b) of the Communications Act. Section 2(b) explicitly restricts the FCC's authority as it provides that "nothing in this chapter shall be construed to apply or to give the [FCC] jurisdiction with respect to . . . charges, classifications, practices, services, facilities, or regulations for or in connection with intrastate communication service." 47 U.S.C. § 152(b). Under the plain terms of this section, the FCC does not have the power to promulgate rules governing pricing for the type of agreements concerning local services that will be concluded under Section 251, and indeed lacks any authority to regulate matters purely within the local exchange. This "congressional denial of power to the FCC" in Section 2(b), moreover, could only

be circumvented if Congress included "unambiguous" and "straightforward" language in the Act either modifying Section 2(b) or, at a minimum, explicitly granting the Commission added authority. See Louisiana Public Serv. Comm'n v. FCC, 476 U.S. 355, 375, 377 (1986). But no provision in the 1996 Act expressly modifies Section 2(b) to grant the FCC authority to regulate either prices or other local matters under Section 251. To the contrary, such a provision was expressly rejected by Congress, for while it was included in the Senate bill, it was not included in the law as enacted. See Conf. Rep. No. 458, 104th Cong., 1st Sess. § 101(c) (1996). And as the FCC itself has acknowledged, Section 251 includes no "explicit grant of intrastate authority to the [FCC]." First Report and Order ¶84.

Notwithstanding the Act's plain and unambiguous language, the FCC has established detailed rules and methodologies for these pricing standards, and has precluded States from considering other methodologies.[6] Moreover, the FCC has established default rates that States must apply until such time as they establish rates that comply with the FCC-mandated pricing methodologies. Quite simply, the FCC has limited the role of State commissions to that of a rubber stamp. But this is not what the Act intends. No agency, including the FCC, can undo the fundamental decision enacted by Congress and signed into law that it is the States that have the primary responsibility for determining pricing.

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[6] First Report and Order at ¶¶ 619, 629, 672-732.

In short, the FCC exceeded its jurisdictional authority by mandating specific pricing methodologies and preempting States; therefore, AT&T's reliance on these methodologies and rates is misplaced. GTE respectfully requests that the Commission (1) deny AT&T's request and disregard the FCC's mandatory pricing rules as an unlawful usurpation of State power and (2) adopt GTE's pricing and avoided-cost methodologies, which satisfy the Act's requirement that GTE and other incumbent LECs recover their true costs.

**D. <u>The FCC's Default Rates Are Wrong</u>.**

Not only did the FCC exceed its authority by setting default rates, but it compounded its error by relying upon erroneous assumptions and flawed studies in setting the rates. This conclusion is illustrated by examining how the FCC selected its default discount rates for wholesale services.

In setting default rates for wholesale services, the FCC attempted to adjust MCI's avoided-cost model to reflect the fact that an incumbent LEC will incur (and therefore should recover) additional costs associated with wholesale services, such as wholesale costs for product management, advertising, and sales. The FCC admitted that there was no evidence upon which to make an adjustment, so it simply "assumed" a default rate:

> We note that, in their own proceedings, several states have made varying estimates concerning the level of wholesale-related expenses in these accounts [ranging from 0% to 25%]. ***Given the lack of evidence***, and the wide range of estimates that have been made by these states, ***we find it reasonable to assume***, for purposes of determining a default range of wholesale discount rates, that ten percent

> of costs in [these accounts] are not avoided by selling services at wholesale.

Order at ¶ 928 (emphasis added).

The FCC's "given the lack of evidence . . . we find it reasonable to assume" approach is, by definition, arbitrary and capricious. In fact, Webster's Dictionary defines the word "arbitrary" as "unsupported." The FCC said, explicitly, that it had no evidentiary support to make a finding, but nevertheless did so. Making decisions in this manner falls squarely within the definition of "arbitrary" and "capricious", in violation of the Administrative Procedure Act, 5 U.S.C. § 706(2)(A). See also Motor Vehicles Mfs. Ass'n v. State Farm Mut.l Auto. Ins. Co., 463 U.S. 29, 43 (1983) (an agency must "examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made"); Competitive Telecommunications Ass'n v. FCC, 87 F.3d 522, 536 (D.C. Cir. 1996) (rejecting FCC rates because "the Commission did not give a reasoned explanation why its adoption [of an interconnection charge] was necessary or appropriate and consistent with the agency's statutory responsibilities"). Here, the FCC's arbitrary action is yet another reason for the Commission not to rely upon the default proxy rates.

The FCC continued its arbitrary approach to rate-making by setting default rates for unbundled loops. This conclusion is illustrated by examining how the FCC selected its default rate for unbundled loops in Florida. In its First Report and Order, the FCC explained that it was setting default rates based on two cost models and on the

unbundled loop rates established by six states, including Florida, that had conducted actual cost studies. First Report and Order at ¶ 792. Those cost studies, however, and in particular the Florida studies, were not based on the FCC's TELRIC method.[7] To the contrary, the Florida studies used a TSLRIC approach and omitted any significant contribution for joint and common costs. These studies systematically understate the costs properly included under the FCC's TELRIC approach. As the FCC noted elsewhere in its Order, the TSLRIC studies prepared by various parties provide a measure of cost lower than TELRIC, and the FCC's pricing standard, unlike the standard used in Florida, expressly requires a "reasonable allocation of joint and common costs." Id. at ¶ 672, 682.

The FCC compounded its error by choosing -- again without explanation -- a proxy rate for Florida that cannot logically be reconciled with the very studies on which the FCC relied. Based on the TSLRIC studies presented to it, the Florida Commission approved a loop price that produced an overall State-weighted average price of $17.28. Given that Florida calculated a loop price based on TSLRIC studies that did not include any significant joint and common costs, one would assume that the FCC's proxy rate for Florida -- which is intended to reflect the FCC's TELRIC methodology and include a reasonable share of joint and common costs -- would be greater than the $17.28 rate

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[7] AT&T contends that GTE's rates for interconnection and unbundled elements should be set at Total Service Long Run Incremental Cost (TSLRIC). There is no meaningful distinction between TSLRIC and the Total Element Long Run Incremental Cost (TELRIC) approach adopted by the FCC. The FCC chose to call its version "TELRIC" to take account of the fact that LRIC pricing was intended to apply to each unbundled Element of the network -- not just the Network itself.

adopted for GTE in Florida. One would be wrong. Without any explanation, the FCC set the average proxy rates for loops in Florida at $13.68 more than 20% less than the average rate set by the Florida Commission. This result cannot be squared with the Florida studies. For all that appears from the Order, the FCC might just as well have picked its default prices out of a hat. The FCC failed completely in its obligation to meet the requirements of reasoned decision making, and the Commission is not bound by the FCC's decision.

The FCC similarly failed to measure up to the standards of reasoned decision making in setting the default prices for unbundled switching. As defined by the FCC, the unbundled end office switching element includes not only the basic switching function of connecting lines and trunks, but also the full range of "features, functions, and capabilities of the switch," including "vertical switching features, such as custom calling and CLASS features." First Report and Order at ¶ 410, 412.

The studies on which the FCC set its default rates, however, were based only on those costs associated with providing a much more narrowly defined switching function. In fact, these studies focused only on those costs associated with transporting additional minutes of traffic from an interconnecting carrier across the local switch. These studies did not purport to examine the costs associated with providing all the "features, functions and capabilities" of the switch. Moreover, these studies considered only the incremental cost of additional minutes of traffic and made no attempt to measure average costs. Accordingly, the studies relied upon by the FCC made no allowance for recovering the joint and common costs expressly required by the FCC's

own rules. Here again, the FCC failed to address the discrepancies between the evidence on which it was relying and its own definitions of both the network element in question and the relevant measure of costs. In the absence of any effort to reconcile the studies with its own rules, the FCC's decision is plainly arbitrary.

**E. The FCC's Default Rates Would Result In a Fifth Amendment Taking.**

The FCC's default rates are not fully compensatory because they would not allow GTE to recover all its costs. Accordingly, the FCC's default rates violate the Act's requirement and the Fifth Amendment's requirement that GTE receive "just and reasonable" compensation for the taking of its property. See, e.g., Brooks-Scanlon Co. v. Railroad Commissioner, 251 U.S. 396 (1920); see also Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982).

This constitutional analysis applies not only to the FCC's default rates, but also to AT&T's pricing methodologies. The regulatory and physical takings issues raised by the FCC's default rates and AT&T's pricing methodologies are discussed in detail in our separate brief on Fifth Amendment Takings.[8] In that brief, we explain why this Commission must interpret the Act so as to provide for the recovery of at least all of GTE's historic and forward-looking costs of unbundled elements or resold services, including a reasonable profit. Indeed, if the Act were interpreted otherwise, it would effect a taking of GTE's property without just compensation in violation of the Fifth and Fourteenth Amendments of the U.S. Constitution and Article 10, Section 6 of our State Constitution. Under familiar principles of statutory construction, such an interpretation

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[8] See "Takings Report" which is part of GTE's Response to AT&T's Petition.

must be avoided because the Commission must read the Act to avoid serious constitutional questions. See, e.g., Rust v. Sullivan, 500 U.S. 173, 190-91 (1991); Ashwander v. Tennessee Valley Auth'y, 297 U.S. 288, 347 (1936) (Brandeis, J., concurring).

## II. PROPER PRICING OF INTERCONNECTION AND UNBUNDLED ELEMENTS.

### A. Introduction.

We explain in greater detail in Report VIII that the proper method for pricing interconnection and unbundled network elements begins with the market-determined efficient component pricing rule. Under M-ECPR pricing,[9] the Commission would establish prices for unbundled elements that would reflect all of GTE's true forward-looking costs. In addition, any price set by the Commission should further reflect any costs to GTE of actually unbundling the network element.

Because M-ECPR is a forward-looking market-based model, however, it fails to capture all of GTE's true network costs. First, GTE will not recover all of its forward-looking costs through M-ECPR, as would regulated rates absent competitive entry. That means there will be "stranded costs" -- defined as revenues under regulation less revenues under competition (on a present value basis). Second, GTE will not recover,

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[9] M-ECPR is the identical methodology that GTE submitted to the FCC in connection with the Interconnection Docket 96-98. It has been designated "M-ECPR" here to avoid any possible confusion because the FCC's version of ECPR bore no relationship to the version submitted by GTE. In short, M-ECPR is not the simplistic, strawman version of ECPR that the FCC created and then destroyed in its First Report and Order.

and earn a fair rate of return on, its historic investments in the very network with which AT&T now seeks interconnection.

Both the shortfall in forward-looking costs and historic costs presents a significant but ***separate*** issue for this Commission. As explained more fully in the attached Economic Testimony (Part VIII), an end-user charge is necessary to allow GTE to recover these costs. Without a full recovery of all of its forward-looking and historic costs, GTE would be forced to fund the transition from regulation to competition, it would subsidize not only AT&T's entry into the market but its continued operation as well, and it would constitute an unconstitutional taking of GTE's property without just compensation.

AT&T, on the other hand, contends that GTE's rates for interconnection and unbundled elements should be set at TELRIC. This pricing methodology contains many flaws, several of which we address here.

**B. <u>AT&T's Approach Ignores Joint and Common Costs</u>.**

First, AT&T's TELRIC approach does not provide for recovery of GTE's joint and common costs -- as required under the Act and the Constitution. AT&T claims that such costs do not exist. According to AT&T's expert economic witness, David L. Kaserman, "recent evidence suggests that the magnitude of common costs in the

[telecommunications] industry has been greatly exaggerated."[10] The threshold question is therefore a simple one: Does GTE have significant joint and common costs?

GTE's cost studies provide ample evidence of GTE's substantial joint and common costs. Indeed, these cost studies demonstrate that the Company's joint and common costs are more than 35% of the Company's total annual revenues. This result is not surprising, because it confirms what is written in most introductory-level economics textbooks: Firms that possess economies of scale and scope have significant joint and common costs. In fact, the FCC itself has recognized that GTE's network enjoys significant economies of scale and scope.[11] AT&T wants the benefits of these economies, but it is unwilling to pay for them.

Finally, AT&T's expert economists who filed affidavits in the FCC's local competition rulemaking agree that "non-trivial" joint and common costs would result from network unbundling:

> At a finer level of disaggregation, there may well be non-trivial costs shared among various subcomponents of any particular aggregative network element. The competitive price for any such subcomponent must be between the subcomponent's unit long run incremental cost and [stand-alone cost]. The revenues from the competitive prices of all the subcomponents of an aggregative network element must

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[10] See Direct Testimony of David L. Kaserman at pages 27-30, filed on August 16, 1996 in AT&T's Petition for Arbitration, Case No. U-11165 (Michigan Public Service Commission). (In support of this claim, Mr. Kaserman cites to the affidavit his colleagues filed on behalf of AT&T in the FCC's local competition rulemaking.)

[11] See, e.g., Order at ¶ 679 ("As a result of the availability to competitors of the incumbent LECs' unbundled network elements at their economic cost, consumers will be able to reap the benefits of the incumbent LECs' economies of scale and scope . . . .").

> sum to the long run incremental cost of the aggregative network element.

(AT&T Appendix C, Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig at n.1.)

In plain English, AT&T's own expert witnesses recognize that as a local telephone network is divided ("unbundled") into smaller and smaller pieces, costs that were once attributable become "unattributable" joint and common costs. Moreover, AT&T's witnesses concede that where joint and common costs exist, the pricing of the individual pieces of the network should be the incremental cost ***plus*** a share of joint and common costs, so that all costs may be recovered.[12] This, of course, is precisely GTE's position.

**C. AT&T's Unbundling and TELRIC Pricing Strategy.**

AT&T's TELRIC methodology is just one-half of AT&T's strategy to obtain the benefits of GTE's network without paying for them. The other half is AT&T's rush to unbundle as many network elements as possible. AT&T's combined unbundling/pricing strategy can be distilled to the following four principles: (1) The more you unbundle the network, the more joint and common (i.e., "unattributable") costs you create; (2) by creating more joint and common costs, you reduce the incremental (i.e., "attributable") costs for unbundled elements; (3) under AT&T's TELRIC proposal, the prices for unbundled elements are set at incremental costs and exclude all joint and common

---

[12] As noted by AT&T's witnesses, the price for the unbundled element should reflect its share of joint and common costs and be set somewhere between the element's long run incremental cost and stand-alone cost.

costs; therefore (4) the more network elements AT&T unbundles, the lower AT&T's total costs for purchasing all the network elements.

In sum, AT&T's unbundling and pricing strategy is intended to push costs from the "attributable" column to the "unattributable" column in a cost study. Of course, GTE's ***total costs*** will remain the same, but under AT&T's proposal GTE will never recover its total costs, because GTE's customers and shareholders will be subsidizing AT&T. One way to visualize AT&T's strategy is to think of a balloon full of hot air: When you squeeze one end, the pressure pushes most of the air to the other end, but the amount of air in the balloon remains the same at all times. AT&T's pricing and unbundling strategy does the same thing -- it pushes costs from the "incremental" category to the "joint and common" category, but the total costs always remain the same.

AT&T's strategy is readily apparent when we examine its request for sub-loop unbundling. AT&T states that it is not interested in sub-loop unbundling at this time, but requests that the Commission find that such unbundling is "technically feasible." Why is AT&T asking the Commission to decide an issue that is not yet ripe? Because it fits squarely within AT&T's pricing and unbundling strategy.

The FCC's rules encourage AT&T to pursue this strategy, because the rules permit AT&T and other requesting carriers to unbundle elements and then reassemble them to provide end-to-end telephone service. First Report and Order at ¶ 328. These rules, however, violate the Act, which draws a distinction between the ***purchase*** of unbundled elements and the ***resale*** of wholesale services. Under the Act, unbundled

elements must be provided at rates based on costs plus a reasonable profit (§ 252(d)(1)), whereas charges for resold services are set at retail rates less avoided costs (§ 252(d)(3)). These different costs serve entirely different purposes, and the "cost plus" rate for unbundled elements is intended to encourage facilities-based competition. The FCC's rules, however, render this distinction meaningless, and permit AT&T to obtain existing retail ***services*** at the cost standard applicable to unbundled ***elements***. Under this scheme, AT&T has little incentive to build its own facilities until it has exhausted GTE's capacity.

The FCC's rules also contradict the intent of the Act because they discourage investment by incumbent LECs. What economic incentive is there for an incumbent LEC to invest in the research and development of new technologies? The very day the ILEC deploys these technologies, AT&T "unbundles" them, obtains them at TELRIC prices, and reassembles them. Congress could not have intended such an illogical result.

**D. <u>AT&T's Approach Ignores GTE's Historic Costs</u>.**

Another flaw in AT&T's TELRIC approach is that it does not allow GTE to recover that portion of its prudently incurred embedded costs not already recovered. As mentioned above, GTE must recover these costs or else there would be a taking without just compensation. In addition, AT&T's proposal is flawed because it relies on the "Hatfield Model," which simply does not work. As discussed in our testimony on the Hatfield Model, the theoretical network spawned by this model will never be

constructed and will never carry a single call. Yet this model serves as the foundation for much of AT&T's case.

The model is also fundamentally flawed in another way: It assumes that the Act permits prices to be set on the basis of something other than GTE's actual costs. But nowhere does the Act provide for this. To the contrary, the Act recognizes that prices must be based on the incumbent LEC's actual costs. For example, § 251(c)(3) requires ILECs to provide access to its network elements. The term "network element" is defined in § 153(29) to mean "a facility or equipment ***used*** in the provision of telecommunications service." Thus, an ILEC is required to provide access to elements the ILEC ***uses*** in the provision of telecommunications service, not elements that ***could*** be used, ***should*** be used, or ***might*** be used in the provision of such service. Similarly, subsection 252(d)(1) of the Act states that the just and reasonable rates for network elements shall be based on the cost of providing the network element, not on the cost of providing a theoretical construct.

Thus, AT&T's proposal is contrary to the Act. It also is contrary to the Constitution, because it would result in a taking of GTE's property in violation of the Fifth Amendment. As discussed in the attached Economic Testimony, GTE would be precluded from recovering its historic costs incurred prior to competition if AT&T's TELRIC approach were adopted. (See Part VIII). Under the Fifth Amendment, however, GTE must have an opportunity to recover and earn a fair rate of return on this investment.

## III. THE PROPER METHOD FOR PRICING RESOLD SERVICES.

As described in greater detail also in GTE's Economic Testimony (Part VIII), the M-ECPR approach to pricing resold services similarly would provide a method for the Commission to establish prices that would reflect GTE's true costs of resale, as required by the Act and the Takings Clause. Simply put, GTE must be allowed to recover its retail price less those avoided costs that it truly avoids -- not what might be "avoidable" under AT&T's wish-list view. Moreover, GTE must be allowed to recover any costs associated with actually having to resell its services.

AT&T's "avoidable" cost methodology, which is based on the FCC's flawed rules, should be rejected by the Commission. Indeed, a full appreciation of AT&T's method only underscores how inappropriate and contrary to the Act its proposed strategy would be.

First, AT&T's and the FCC's methodology is based on an ILEC's "avoidable" rather than "avoided" cost. The Act, however, is very clear in providing that wholesale rates shall be determined by State commissions "on the basis of retail rates charged to subscribers . . . excluding the portion thereof attributable to any marketing, billing, collection, and other costs ***that will be avoided*** by the local exchange carrier." 47 U.S.C. § 252(d)(3) (emphasis added). Congress' use of the word "will" rather than "could" conclusively establishes that wholesale rates must be set based on the ILEC's avoided, not "avoidable," cost.

Second, AT&T's and the FCC's methodology assumes that GTE will not incur ***any*** retail costs. Therefore, all of GTE's costs associated with retail sales, advertising,

product management, customer services, and similar services have been excluded from AT&T's avoided cost study. This assumption is, of course, absurd. To assert that GTE will not at the very least maintain its ***existing*** level of advertising expenses and other customer-support expenses defies logic and assumes that on the first day AT&T enters the local telephone market, GTE will lose 100% of its retail business.

Third, as discussed in the direct testimony of GTE's Avoided Cost witness, GTE's avoided cost studies show that, based upon reasonable estimates of avoided retail expenses and additional wholesale expenses, GTE's avoided costs equate to 7%. This figure is well below AT&T's proposed 25% rate and the FCC's 18.81% default proxy rate.

Here again, both AT&T's proposal and the FCC's default rates would not allow GTE to recover its total costs, and therefore both approaches would result in a taking of property without just compensation.

## IV. COST RECOVERY ISSUES.

### A. Introduction.

Several of AT&T's requests -- particularly its request for loop and switch unbundling, AIN unbundling, and operator support services -- require significant modifications to GTE's existing networks; and in many instances, they would require new technologies to be developed and deployed. The question, of course, is who should bear the cost of these modifications and technologies.

In its rules, the FCC rejected the ILECs' position that requesting carriers "take the ILEC networks as they find them." The FCC requires ILECs to take "affirmative

steps" to modify their existing facilities to meet the requirements of requesting carriers. See, e.g., Order at ¶ 382. But the FCC recognizes that the ***requesting carrier*** must bear the cost of compensating the ILEC for such modifications.[13] Simply put, if a CLEC demands changes to an ILEC's network, it must pay for them.

AT&T does not agree that it should have to pay for modifications to accommodate its own requests. Instead, AT&T would have GTE and its customers pay for these modifications and, once again, fund AT&T's entry into the market. But the FCC appears to place this burden on the requesting party:

> We find that the 1996 Act bars consideration of costs in determining "technically feasible" points of interconnection or access [to unbundled elements]. Of course, a requesting carrier that wishes "technically feasible" but expensive interconnection would, pursuant to section 252(d)(1), be required to bear the cost of that interconnection, including a reasonable profit.

Id. at ¶¶ 198, 199.

This Section of the brief discusses two of AT&T's more costly demands, and explains why they are inconsistent with the language and purpose of the Act.

**B. AT&T's Demands for Switch Unbundling.**

Perhaps the most unreasonable demand made by AT&T is its demand for switch unbundling so that AT&T can route its customers to AT&T's own operator services (OS) and directory assistance (DA) platforms. To offer AT&T this functionality, GTE would

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[13] See, e.g., First Report and Order at ¶ 382 (the requesting carrier must bear the cost of compensating the ILEC for loop conditioning); ¶ 393 ("the new entrant bears the cost of connecting its NID to the incumbent LEC's NID"); ¶ 751 (ILECs may recover costs of collocation cages).

be required to spend considerable time, money, and resources in modifying its switches. In fact, GTE likely would have to pay for new software to increase its switch capacity throughout many of its central offices. But AT&T dismisses this cost issue out of hand. It arrogantly states that if a GTE switch "has a problem" in meeting AT&T's demands, "it is not AT&T's responsibility to solve GTE's routing issues,"[14] and that AT&T "is looking to GTE to expeditiously develop, along with [GTE's] switch vendors, the appropriate solutions to allow AT&T the option of choosing which serving arrangement to employ." Id.

AT&T also requests loop unbundling for all of GTE's access lines. Presumably, AT&T wants the ability to order an unbundled loop from anywhere in GTE's territory and have this loop provisioned immediately. As discussed in GTE's testimony, given the configuration of GTE's existing network, which was efficiently designed with the assumption that only one company would access it, GTE would have to spend well in excess of $100 million to meet AT&T's demands.

**C. Operations Support Systems.**

AT&T demands that GTE and its customers should pay the costs of an "electronic bonding" system and provide access to operations support systems. The costs of developing and providing these systems are unknown, but they are likely to be quite high based upon GTE's experience in developing systems for its own use. For

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[14] Direct Testimony of AT&T Witness Robert V. Falcone at 15, presented in the Arbitration Proceedings before the Commonwealth of Virginia State Corporation Commission. This appears to be AT&T's position in Florida (see Direct Testimony of Ray Crafton at 22-23) as well as across the country.

example, over the last four years, GTE has engaged in an unprecedented overhaul of its operations support systems, spending almost $400 million to bring its systems to the level they are at today. The work to develop AT&T's systems is likely to be of the same magnitude, but AT&T ignores this real-world concern. Once again, principles of constitutional law and common sense dictate that AT&T cannot require GTE to design, develop and fund systems for AT&T's benefit.

## V. TECHNICAL FEASIBILITY.

Many of the cost recovery issues raised by AT&T's request flow from the FCC's definition of technical feasibility. In its Order, the FCC adopted a very broad definition of this term:

> We conclude that the term 'technically feasible' refers solely to technical or operational concerns, rather than economic, space, or site considerations.

(First Report and Order at ¶ 198). The FCC concluded that all State commissions ***must*** apply this definition in their arbitrations. ( Id. at ¶ 281).

GTE disagrees with the FCC's definition. Indeed, under this definition almost anything is "feasible," because the question of feasibility is decided in a vacuum without reference to real-world concerns such as cost, space, time, or existing network configurations. Indeed, under the FCC's definition, it might be "technically feasible" to provide telephone service from here to Mars -- but at what price? As a threshold matter, GTE requests that the Commission reject the FCC's definition and adopt a more reasonable definition that is consistent with the Act. Specifically, GTE believes that "technical feasibility" must be defined with regard to an incumbent LEC's ***existing***

network, and not some hypothetical network that can be built only after significant costs are incurred -- ironically, costs which AT&T would force upon GTE and its customers.

One example will perhaps help illustrate this point. AT&T requests that GTE unbundle its switch so that AT&T can route its customers' traffic to AT&T's operator services, directory assistance platforms, and dedicated trunk groups linked to interexchange carriers of AT&T's designation. AT&T states that such unbundling is technically feasible because GTE's switches already provide this capability, and "the only difference is that GTE will receive a service order from the new carrier's service center as opposed to its own GTE service centers."[15]

AT&T's request is predicated upon an erroneous assumption. AT&T seeks the ability to do much more than just provide GTE with a service order. Indeed, AT&T wants GTE to establish separate trunk groups so that AT&T can route its customers' calls to AT&T owned and operated OS and DA centers. This request is not technically feasible because it ignores the limited switch capacity available to meet AT&T's demands. Moreover, as discussed above, AT&T ignores the fact that substantial costs will be incurred to provide existing switches with the capability of performing the routing requested by AT&T.

Finally, unbundling the switch as AT&T requests will permit AT&T to avoid access charges, because GTE will have no way of knowing whether a call routed by AT&T is a local call, an intraLATA call, or a long-distance call. The Act and the FCC

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[15] Direct Testimony of Robert V. Falcone at 15, presented before the Commonwealth of Virginia State Corporation Commission.

rules require AT&T to continue paying certain access charges for a limited time, but AT&T's proposal will enable it to do indirectly that which it cannot do directly.

## Conclusion

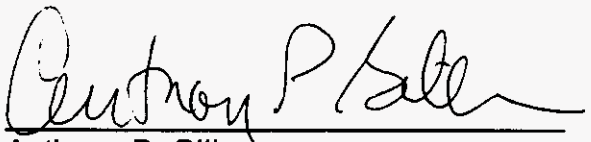
In determining the appropriate price for the sale of unbundled elements or resold services, the Commission must provide to GTE the recovery of at least all of its historic and forward-looking costs of unbundled elements or resold services plus a reasonable profit. If the Act were interpreted to provide anything less, then it would effect a taking of GTE's property without just compensation in violation of the Constitution.

AT&T's principal goal in this proceeding is to acquire GTE's network and services at a rate well below GTE's costs. AT&T also seeks to force GTE and its customers to incur costs exceeding hundreds of millions of dollars so that AT&T can have its own local network without having to pay for it. In short, AT&T wants GTE and its customers to subsidize AT&T's foray into the local telecommunications marketplace.

AT&T should not be allowed to twist the Act to promote its own interests at the expense of everyone else, and the Constitution prohibits AT&T from doing so. To ensure that the purposes of the Act are met, GTE respectfully requests that the Commission do two things: First, the Commission should refuse to adopt the FCC's arbitrary default rates and refuse to establish ***any*** rate for GTE's network elements or services until the parties have presented their evidence. Second, the Commission should establish pricing methodologies and cost recovery mechanisms that will ensure AT&T pays its own way for its entry into the local telecommunications market.

GTE's proposals -- especially its M-ECPR pricing methodology -- properly balance the interests of the parties and the public with the letter and spirit of the Act. Accordingly, GTE respectfully requests that this Commission adopt GTE's proposals.

Respectfully submitted on September 10, 1996.



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# TAKINGS REPORT

## Introduction

In determining the appropriate price for the sale of unbundled elements or the resale of services by GTE Florida Incorporated ("GTE") in response to AT&T's Arbitration Petition (dated August 16, 1996) ("AT&T Petition"), the Florida Public Service Commission (the "Commission") must interpret the federal Telecommunications Act of 1996 (the "Act" or "1996 Act") to provide for the recovery of at least all of GTE's historic and forward- looking costs of unbundled elements or resold services plus a reasonable profit. As we demonstrate below, if the Act were interpreted to require GTE to sell unbundled elements or resell services at prices that do not cover all of GTE's costs associated with those elements or services, then the Act would effect a taking of GTE's property without just compensation, in violation of the Fifth and Fourteenth Amendments of the U.S. Constitution, as well as Article 10, Section 6 and Article 1, Section 9 of the Florida Constitution.

Under familiar principles of statutory construction, such an interpretation must be avoided because the Commission must read the Act to avoid serious constitutional questions. See, e.g., Rust v. Sullivan, 500 U.S. 173, 190-91 (1991); Ashwander v. Tennessee Valley Authority, 297 U.S. 288, 347 (1936) (Brandeis, J., concurring). Indeed, in the specific context of takings, the Supreme Court has admonished that if an "identifiable class of cases [exists] in which application of a statute will necessarily constitute a taking," then concerns for avoiding uncompensated takings properly require a narrowing construction of the statute. United States v. Riverside Bayview Homes, Inc., 474 U.S. 121, 128 n.5 (1985).

As we demonstrate below, under either a regulatory takings or physical occupation analysis, the Act would effect an unconstitutional taking if it were interpreted to require GTE to sell its elements or services below their true costs to AT&T or to any competitive local exchange carrier ("CLEC"). Thus, to avoid constitutional infirmity, the Commission must read the Act to require prices that cover all of GTE's costs plus a reasonable profit. In the specific context of this arbitration, that principle requires at least two things:

First, at a minimum, the prices set for unbundled elements or resold services must cover at least the following five elements, which comprise GTE's true forward-looking costs:

**(i) Incremental Costs.** The prices set must cover GTE's total element long-run incremental cost of providing that service ("TELRIC"). Moreover, the principle that all of GTE's true costs must be recovered requires that TELRIC be calculated based on GTE's actual network architecture, not on some hypothetical, more efficient network that could now be constructed.

**(ii) Joint And Common Costs.** The principle that GTE must be allowed to recover all its costs further requires that prices be set to allow GTE to recover all of its forward-looking joint and common costs, not just a portion of those costs. Any pricing rule that denies GTE recovery for all its joint and common costs, or provides for the recovery of only a portion of those costs, necessarily requires GTE to sell below its true costs and thereby would effect an uncompensated and unconstitutional taking.

(iii) **Cost of Subsidies.** To the extent that the current price of an unbundled element or a resold service contains a subsidy, or "contribution" towards either the cost of the provision of a service that Florida requires GTE to provide at regulated prices that are below cost or the cost incurred as a result of incumbent burdens that GTE continues to bear after the advent of competition, then GTE must recover its costs unless and until Florida allows GTE to rebalance its rates or eliminates the mandated subsidy.

(iv) **Costs of Unbundling or Resale.** Any price set under the Act must include any additional costs incurred to accomplish unbundling or resale.

(v) **No Overstated Avoided Costs.** With respect to resold services, GTE cannot be required to resell services below their true costs (considering all other elements listed here) or with a discount that exceeds GTE's truly avoided costs.

Second, even if the Commission were to allow GTE a recovery of its forward-looking incremental costs plus a reasonable profit, GTE still must be allowed to recover any portion of its historical costs not yet recovered and to earn a fair rate of return on that investment. Accordingly, the Commission must provide for some mechanism -- such as an end-user charge or surcharge -- by which GTE recovers the difference between the reasonable return that it was promised on its historical, embedded costs and what it will now receive under a regime of competition. For GTE, the transition from regulation to competition means that its market will be opened up to competition yet it will be saddled with the heavy costs of an incumbent local exchange carrier (like universal service and carrier of last resort), while its competitors will not

only be free of those burdens but will also be allowed to purchase or lease GTE's services or network elements at heavily discounted prices -- which GTE itself will subsidize. The Takings Clause requires that GTE be allowed to recover the substantial investments it made under a regulated-monopoly regime in which the Commission promised GTE that it would be able to recover and earn a fair rate of return on its investments.

## Discussion

### I. THIS COMMISSION IS NOT BOUND BY THE FCC'S PRICING RULES.

As a predicate matter, it is important to point out that the Commission is not bound by the pricing rules set in the Federal Communications Commission's ("FCC's") First Report and Order for two wholly independent reasons.[1] First, the FCC had no statutory authority to set the pricing rules and default prices it did (see Part I.A below). Second, even if it did, the prices it did set would work an unconstitutional taking. (See Part II.B.) In either case, the Commission is not bound to follow the FCC's prices. Indeed, the Commission is under a statutory duty to interpret the Act for itself and a constitutional duty to ensure that GTE receives just compensation for opening up its network to unbundling and resale.

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[1] In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket 96-98, CC Docket 95-185, FCC 96-325 (released Aug. 8, 1996) ('First Report and Order") ¶¶ 618-984.

### A. The FCC Lacks Authority To Promulgate National Pricing Standards Governing Agreements Under Section 251 of the Act.

The FCC's attempt to set national pricing standards to govern interconnection, unbundling, and resale agreements negotiated under Sections 251 and 252 of the Act is inconsistent with Congress' scheme to have the States (through arbitrations) and private parties (through negotiations) establish prices. It is clear -- both under the Act and under Section 2(b) of the Communications Act of 1934 -- that the FCC lacks the power to promulgate national pricing standards. See 47 U.S.C. § 152(d).

#### 1. Only The Commission Was Granted Pricing Authority.

In the event that the parties to a negotiation cannot agree on the price for interconnection, unbundled access or resale, the Act expressly assigns to State commissions, not the FCC, the power to determine those prices through the arbitration process. Section 252(c)(2) provides, in terms that could not be clearer, that "a State Commission shall . . . establish any rates for interconnection, services, or network elements according to subsection (d)." 47 U.S.C. § 252(c)(2) (emphasis added). Subsection (d)(1) then goes on to provide that "[d]eterminations by a State commission of the just and reasonable rate for . . . interconnection . . . and [access to unbundled] network elements" shall be based on "cost" and "may include a reasonable profit." 47 U.S.C. § 252(d)(1) (emphasis added). Similarly, subsection (d)(3), governing resale, expressly provides that "a State Commission shall determine wholesale rates . . . ." 47 U.S.C. § 252(d)(3) (emphasis added). These sections, in unambiguous terms, assign

to the State commissions -- not the FCC -- the power to set prices for interconnection, unbundling, and resale.

If the explicit statutory text assigning the power to determine prices to State commissions were not clear enough, then the structure of the Act makes the point even clearer. Section 252(c)(1) provides, generally, that in imposing conditions on the parties to a negotiation, a State commission shall ensure that such conditions meet the requirements of both "section 251" and "the regulations . . . prescribed by the [FCC] pursuant to section 251." 47 U.S.C. § 252(c)(1). By contrast, the very next subsection -- § 252(c)(2), which governs pricing -- provides that a State commission shall establish rates for interconnection and unbundling "pursuant to subsection (d)." 47 U.S.C. § 252(c)(2). There is no mention of any FCC regulations on pricing issues. Thus, where Congress wanted the State commissions to follow the FCC's regulations (§ 252(c)(1)), it said so explicitly; by contrast, with respect to setting prices, Congress expressly omitted any reference to regulations by the FCC, and referred instead only to the substantive requirements imposed on the State commissions by § 251(d) in determining prices.

**2. The FCC Has No Pricing Authority.**

The textual basis relied on by the FCC to assert jurisdiction to determine prices only highlights the weakness of its position. The FCC concedes that "we recognize that these sections [§§ 251 and 252] do *not* contain an explicit grant of intrastate authority to the [FCC]." First Report and Order ¶ 84 (emphasis added). The FCC finds purported textual authority to determine prices in the directive in § 251(d)(1) stating that "[w]ithin 6 months after the date of enactment of th[is Act], the [FCC] shall

complete all actions necessary to establish regulations to implement the requirements of this section." 47 U.S.C. § 251(d)(1).

It is quite unreasonable for the FCC to rely on § 251(d)(1) as granting the FCC authority to determine prices. First, that section has nothing to do with granting the FCC the authority to do anything. It merely sets time deadlines for those tasks the FCC is otherwise given under the Act. Indeed, Section 251(d)(1) is a limitation on the FCC -- requiring it to act within sixth months -- not a grant of authority. Second, to the extent that § 251(d)(1) impliedly grants the FCC authority to issue regulations, it does so only with respect to certain specific tasks expressly assigned to it by the Act. It is not a general grant of authority for the FCC to establish prices. Thus, for example, § 251(e)(1) expressly directs the FCC to "create or designate one or more impartial entities to administer telecommunications numbering." 47 U.S.C. § 251(e). That obviously has nothing to do with pricing.[2]

Section 2(b) of the Communications Act of 1934 (codified at 47 U.S.C. § 152(b)) provides that "nothing in this chapter shall be construed to apply or to give the [FCC] jurisdiction with respect to . . . charges, classifications, practices, services, facilities, or regulations for or in connection with intrastate communications service." The Supreme Court has held that this "congressional denial of power to the FCC" over

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[2] If anything, § 251(d) **confirms** by implication that the FCC has no authority under the Act to determine the prices for interconnection, unbundling and resale. That is so because § 251(d)(2), while expressly articulating the substantive standards to govern the FCC's power to determine which network elements to unbundle, omits any reference to any substantive standards to govern the determining of pricing. 47 U.S.C. § 251(d)(2). Rather, the only place those substantive standards -- governing pricing -- are found are in § 252(d)(1), which expressly refers to the substantive standards governing the State commissions' determination of prices. 47 U.S.C. § 252(d)(1).

prices and other matters regarding the provision of local telephone service can be overcome only if Congress includes "unambiguous" and "straightforward" language in the Act either modifying § 2(b) or expressly granting the FCC additional authority. See Louisiana Pub. Serv. Comm'n v. FCC, 476 U.S. 355, 374, 377 (1986).

Obviously, neither exception to § 2(b) is present here. Whatever else can be said of § 251(d)(1), it cannot be said that that section "unambiguously" or "straightforwardly" gives the FCC the authority to set the prices for interconnection and unbundling of the local telephone network or resale of local telephone service. Similarly, no provision in the 1996 Act expressly modifies § 2(b) in granting to the FCC authority to regulate either prices or other local matters under § 251. To the contrary, such a provision **was expressly rejected by Congress**, for while it was included in the Senate bill, it was not included in the law as enacted. See Conf. Rep. No. 458, 104th Cong., 1st Sess. § 101(c) (1996). Indeed, even the FCC concedes that no provision of the 1996 Act "contain[s] an explicit grant of intrastate authority to the [FCC] . . . ." First Report and Order, ¶ 84.

In response to this fatal § 2(b) problem, the FCC contends that the 1996 Act supposedly "moves beyond the distinction between interstate and intrastate matters that was established by the 1934 Act" and that section 251 "should take precedence" over any "contrary implications" in § 2(b). First Report and Order ¶¶ 24, 83, 93. But that "reasoning" is plainly flawed on a number of different levels.

Most notably, there is simply no grant of authority over prices in § 251 to "take precedence" over the rule of § 2(b). In addition, the Supreme Court could not have been more clear that § 2(b) deprives the FCC of jursidiction over intrastate

communications services unless some later act expressly modifies § 2(b) or expressly grants the FCC power over intrastate communications services. See Louisiana Pub. Serv. Comm'n, 476 U.S. 355. The FCC's general "sense" that the 1996 Act impliedly "moves beyond the distinction between interstate and intrastate matters established by [§ 2(b)]" cannot overrule the explicit "congressional denial of power to the FCC" in § 2(b).

* * *

In sum, the plain language of the Act, the structure of the Act, the rule of construction specified by Congress in Section 2(b), and important policy concerns all demonstrate that the FCC has no authority to set the prices for interconnection, unbundling, and resale. That task is plainly and unequivocally given to the Florida Commission.

### B. Even If The FCC Had The Authority To Set Prices, Both Its Pricing Methodology And Its Default Proxy Rates, If Followed, Would Effect A Taking.

#### 1. The FCC's Pricing Methodologies Would Effect A Taking.

Even if the FCC had the authority to set prices (which it does not), the standards it has chosen are an impermissible interpretation of the Act because they would not compensate GTE fully for its true costs. As we demonstrate below (Parts II-III), the FCC's pricing methodology is defective for a variety of reasons. Principally, though, it fails to allow GTE full recovery of its historic costs and fails to allow GTE its full measure of joint and common costs on a forward-looking basis. Both aspects of the FCC's defective pricing methodology only underscore why anything less than full

recovery of GTE's costs, as discussed in more detail in Report VIII, would effect an unconstitutional taking without just compensation.

### 2. The FCC's Default Proxy Rates For Unbundling, Interconnection And Resale Are Procedurally Defective And Effect A Taking.

The FCC also erred in several respects in establishing the default proxy prices for interconnection, unbundled elements, and resale under the Act. See First Report and Order ¶¶ 767, 932. First, the FCC erred by circumventing the congressionally designed State-sponsored arbitration process by establishing default prices through a rulemaking -- and an abbreviated rulemaking at that. By design, the arbitration process was intended by Congress to allow the Commission to engage in the fact-specific decision making tied to the circumstances of each case. By attempting to arrive at default proxy rates through a rulemaking, the FCC usurped the role of the Commission and deprived parties of the fact-specific adjudicative process contemplated under the Act, violating both the Administrative Procedure Act and the Due Process Clause of the Constitution.

Further, the default proxy rates established by the FCC for interconnection and unbundled elements are defective because they are not only inconsistent with the FCC's own flawed pricing methodology but they also effect an unconstitutional taking. As we show in Report VIII, the FCC's proposed proxy rates fall well below the minimum that GTE must recover for resale and unbundled elements in order to recover its true costs and avoid an unconstitutional taking without just compensation.

In short, under the Act, the Commission -- not the FCC -- has the right and obligation to set the prices for unbundled elements and resold services. Moreover, the Commission is bound to read the Act in a manner that avoids constitutional infirmity, and it need not follow an interpretation by the FCC that raises such constitutional difficulties. Thus, the Commission should determine on its own what pricing rule the Act and the Constitution require without reference to the FCC's First Report and Order.[3]

## II. THE TAKINGS CLAUSE PROHIBITS GTE FROM BEING REQUIRED TO SELL ELEMENTS OR SERVICES BELOW THEIR TRUE COSTS.

Whether AT&T's Petition is analyzed as a regulatory takings issue because its proposed rates would be confiscatory and, therefore, unconstitutional (see Part II.A below) or as a physical per se taking because AT&T's Petition proposes a physical occupation of GTE's network without just compensation (see Part II.B below), the result is the same: The Fifth and Fourteenth Amendments simply prohibit Congress and the States from requiring GTE to sell elements or services at prices that do not cover all of their true costs, plus a reasonable profit.

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[3] On August 28, 1996, GTE sought a stay from the FCC of its Report and Order pending judicial review and requested that the FCC act on GTE's motion within 10 days. If the FCC has not acted within that time, GTE intends to seek a stay from a federal Court of Appeals.

## A. Regulatory Takings Analysis.

### 1. Regulators Cannot Force a Business to Operate at a Loss.

The Supreme Court's Brooks-Scanlon decision long ago established the rule that the Takings Clause of the U.S. Constitution forbids a regulator from forcing a utility to operate a segment of its business at a loss because the firm happens to be profitable elsewhere in another segment of its business. Brooks-Scanlon Co. v. Railroad Comm'n of Louisiana, 251 U.S. 396, 399 (1920). The Supreme Court concluded that

> [a] carrier cannot be compelled to carry on even a branch of business at a loss, much less the whole business of carriage . . . . The plaintiff may be making money from its sawmill and lumber business but it no more can be compelled to spend that than it can be compelled to spend any other money to maintain a railroad for the benefit of others who do not care to pay for it.

Brooks-Scanlon stands for the proposition that the Commission may not force a regulated entity to provide a regulated service below cost without providing compensation. See also Northern Pac. Ry. Co. v. North Dakota, 236 U.S. 585, 595 (1915) (to same effect, noting that "[t]he fact that the property is devoted to a public use on certain terms does not justify the requirement that it shall be devoted to other public purposes").[4]

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[4] Many courts have reaffirmed Brooks-Scanlon's rule that a railroad may not be required to operate part of its business at a loss. See, e.g., Railroad Commission of Texas v. Eastern Texas R.R. Co., 264 U.S. 79, 85 (1924) (state regulators cannot require continued operation of railroad line at a loss); Bullock v. Florida, 254 U.S. 513, 520-21 (1921) (same); National Wildlife Fed'n v. ICC, 850 F.2d 694, 707 (D.C. Cir. 1988) (reaffirming "general rule" set forth by Brooks-Scanlon and Bullock that "[a] carrier cannot be compelled to carry on even a branch of business at a loss, much less the whole business of carriage"); Gibbons v. United States, 660 F.2d 1227, 1233 (continued...)

It is no answer to the Brooks-Scanlon principle that the firm may have an overall rate of return that covers its costs based on sales of other services. In Duquesne Light Co. v. Barasch, 488 U.S. 299 (1989), the Supreme Court carved out an exception to Brooks-Scanlon along those very lines, but that exception has no application here. Duquesne suggests that all that matters for purposes of the Takings Clause is the net effect of regulation on the enterprise. Duquesne involved two utilities that challenged a state statute prohibiting a utility from recovering in its rates an investment that was not used and useful. The $35 million investment at issue in Duquesne reduced the rate base for one of the utilities by 1.9% and reduced its revenue by 0.4%; for the other, it reduced the utility's rate base by 2.4% and its revenue by 0.5%. The Court reasoned that there was a negligible effect on the overall financial status of both utilities. The Court thus focused not on any one aspect of an order, but rather on the overall effect of regulation on the enterprise:

> Errors to the detriment of one party may well be canceled out by countervailing errors or allowances in another part of the rate proceeding.

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(...continued)
(7th Cir. 1981) ("Brooks-Scanlon and Bullock define the basic limitations upon a modern railroad's public service obligation in the face of financial loss. . . . The constitutional principle embodied in these decisions retains its vitality; a railroad cannot be compelled to continue unprofitable operations indefinitely") (citation omitted); In re New York, New Haven & Hartford R.R., 304 F. Supp. 793, 804 (D. Conn. 1969) ("This court . . . concludes that Brooks-Scanlon and subsequent cases, reaffirming the validity of its holding, are still applicable and determinative."), aff'd in part, vacated in part, 399 U.S. 392 (1970); New York, New Haven & Hartford R.R. v. United States, 289 F. Supp. 418, 440-41 (S.D.N.Y. 1968) (3-judge court) (Friendly, J.) ("We see no reason to question the validity of Justice Holmes' decision in [Brooks-Scanlon] . . . forbidding the State of Louisiana to require a railroad to continue its deficit operation with no hope for profits in the foreseeable future."), vacated, 399 U.S. 392 (1970) (citation omitted).

> The Constitution protects the utility from the net effect of the rate order on its property.

Id. at 314. The Duquesne Court also made clear that there would have been a taking if the allowed rates had been "inadequate to compensate current equity holders for the risk associated with their investments under a modified prudent investment scheme." Id. at 312.[5]

The central insight in Duquesne was that there was no need to analyze closely the method used by the regulator as long as it passed constitutional scrutiny by allowing the firm to earn a competitive rate of return on invested capital. **But, the premise of the decision -- which distinguishes it from Brooks-Scanlon -- was that the regulator could and did insulate the regulated utility from competition and thus guarantee a constitutionally acceptable outcome.** Thus, to the extent that the "end-result" test of Duquesne suggests that a regulator could force a utility to operate one segment at a loss, that reasoning has no application here. It may well be that GTE is still subject to "regulation" by the Commission, but that no longer means what it once did in a regulated monopoly regime. Now, under competition, GTE no longer is insulated from the competitive forces of the marketplace. This has nothing to do with whether competition, as a normative matter, is the best policy. It simply means that

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[5] See also Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944) ("[R]eturn to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."); Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n, 262 U.S. 679, 692-93 (1923) ("A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risk and uncertainties").

AT&T cannot rely on the exception in Duquesne to justify the Commission setting insufficient rates for resale, unbundled elements, and interconnection on the theory that GTE may be profitable elsewhere in its system. For these reasons, the Brooks-Scanlon rule governs this case, and the Commission cannot force GTE to operate any segment of its business at a loss.

**2. The Commission Must Ensure GTE A Fair Rate of Return.**

Whether the Brooks-Scanlon or Duquesne model applies, a regulator must ensure the utility a fair, non-confiscatory rate of return. That requires a utility's investors to earn a return that is commensurate with investments having a similar risk. As the Supreme Court concluded in Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591 (1944):

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

320 U.S. at 603 (emphasis added).

In Duquesne, as explained above, the Court reaffirmed that "the return investors expect given the risk of the enterprise" is always relevant to the constitutional adequacy of a rate. Duquesne, 488 U.S. at 314. In support of this point, the Court quoted with approval from its opinion in Bluefield Water Works & Improvement Co. v. Pub. Serv. Comm'n, 262 U.S. 679 (1923), which held that a utility is entitled to rates that will enable it to earn a return "'equal to that generally being made at the same time

and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties.'" Id. at 314-15 (quoting Bluefield Water Works, 262 U.S. at 692).[6] Thus, pursuant to the Takings Clause, the Commission must interpret the Act to allow GTE sufficient recovery of its invested capital to maintain its credit, to attract capital, and to ensure a return that will be commensurate with investments of a similar risk. See also Tenoco Oil Co. v. Department of Consumer Affairs, 876 F.2d 1013, 1020 (1st Cir. 1989) ("To be just and reasonable, rates must provide not only for a company's costs, but also for a fair return on investment. Rates which fall below this standard are 'confiscatory'") (citation omitted), aff'd, 60 F.3d 864 (1st Cir. 1995); Medical Malpractice Joint Underwriting Ass'n v. Paradis, 756 F. Supp. 669, 676 (D.R.I. 1991) (holding unconstitutional an insurance rate that would have caused insurance companies to incur a loss).

It has also long been required that just compensation for a taking requires that the property owner be put in the same position as he would have been if the exchange had been voluntary -- as opposed to involuntary (as here). Consistent with this principle, courts have held that the owner is "to be put in as good a position pecuniarily as if his property had not been taken." Olson v. United States, 292 U.S. 246, 255 (1934); see also United States v. Reynolds, 397 U.S. 14, 16 (1970);

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[6] See also Illinois Bell Tel. Co. v. FCC, 988 F.2d 1254, 1263(D.C. Cir. 1993) (test to be applied in evaluating a rate order is "whether the 'end result' meets the Hope standards: attraction of capital and compensation for risk"); Jersey Central Power & Light Co. v. FERC, 810 F.2d 1168, 1178, 1181 (D.C. Cir. 1987) (en banc) (utility's inability to pay dividends to common shareholders supported contention that FERC's rates were confiscatory) (citing Permian Basin Area Rate Cases, 390 U.S. 747, 792, 812 (1968)).

Hedstrom Lumber Co. v. United States, 7 Cl. Ct. 16, 27 (1984) (citing Foster v. United States, 2 Cl. Ct. 426, 445 (1983)) (to same effect); see generally Richard A. Epstein, Takings: Private Property And The Power Of Eminent Domain 182 (Harvard University Press 1985) ("In principle the ideal solution is to leave the individual owner in a position of indifference between the taking by the government and retention of the property").[7]

Applying these takings principles here requires that GTE recover its full joint and common forward-looking costs as well as its historic costs. Anything less would jeopardize GTE's ability to continue attracting capital, would not afford its investors a return commensurate with the risk of similar investments, and would fail to place GTE in the position it would have been had its property not been taken through confiscatory pricing.

**B. Physical Occupation Analysis.**

The Commission must set prices for unbundled elements and resold services that allows GTE a recovery of its true costs and reasonable profit for yet another wholly independent but related reason. AT&T's proposals would amount to a per se taking by physical occupation of various parts of GTE's network.

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[7] See also Yancey v. United States, 915 F.2d 1534, 1542 (Fed. Cir. 1990) ("the fair market value of property under the Fifth Amendment can include an assessment of the property's capacity to produce future income if a reasonable buyer would consider that capacity in negotiating a fair price for the property"); Cloverport Sand & Gravel Co. v. United States, 6 Cl. Ct. 178, 188 (1984) (fair market value has been defined as the amount a "willing buyer would agree to pay a willing seller in cash, with neither party being under a compulsion to buy or sell"). Accord United States v. New River Collieries Co., 262 U.S. 341, 343 (1923); Seaboard Air Line Ry. v. United States, 261 U.S. 299, 304 (1923).

In Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982), the Supreme Court held that a New York law requiring a landlord to permit installation of cable television equipment on rental property was a constitutionally compensable taking. The Court held that, while "no 'set formula' existed to determine, in all cases, whether [government regulation of private property constitutes a taking]," where the government authorizes a permanent physical occupation of one's property by a third party, a taking is determinatively established. Id. at 426. The Court held that the law at issue in Loretto plainly amounted to a taking by a physical occupation because the "installation involved a direct physical attachment of" the cable company's equipment to the owner's property. Id. at 438.

The Supreme Court revisited the application of takings principles by permanent physical occupation to highly regulated industries in FCC v. Florida Power Corp., 480 U.S. 245 (1987). In that case, a utility company challenged on takings grounds the provisions of the Pole Attachments Act that authorized the FCC to set the rates that utility companies could charge cable television companies for using their utility poles for stringing television cable. The Court held that

> Loretto ha[d] no applications to the facts of [Florida Power -- and there was no taking by physical occupation -- because while] the statute we considered in Loretto specifically required landlords to permit permanent occupation of their property by cable companies, nothing in the Pole Attachments Act as interpreted by the FCC . . . gives cable companies any right to occupy space on utility poles, or prohibits utility companies from refusing to enter into attachment agreements with cable operators.

Id. at 250-51 (emphasis added).

In other words, where, as in Florida Power, the property owner voluntarily invites the third party onto its property (by lease or otherwise), there is no permanent

physical occupation mandated by the government and hence no taking for that reason, and the government is free to regulate the terms of the lease or other invitation (i.e., regulate the use of the property) without effecting a per se taking by physical occupation. Or, as the Supreme Court put it, the "element of required acquiescence is at the heart of the concept of [per se taking by physical] occupation." Id. at 252. See also Yee v. Escondido, 503 U.S. 519, 527 (1992) ("required acquiescence is at the heart of the concept of [taking by physical] occupation").

Florida courts have explicitly recognized the principles laid down by the U.S. Supreme Court. See, e.g., Storer Cable T.V. of Florida, Inc. v. Summerwinds Apartments Associates, Ltd., 493 So. 2d 417 (1986); Beattie et al. v. Shelter Properties, 457 So. 2d 1110 (Fla. 1st DCA 1984).

Applying these well-settled principles here, it is plain that the obligations imposed on GTE under section 251 -- collocation, unbundled network access to the local loop, pole attachments, and access to GTE databases -- constitute a taking by permanent physical occupation.

1. **Physical Collocation.**

AT&T has requested physical collocation. (AT&T Petition at 11, Attachment 1 at 4.) As described in the testimony of GTE witness Ries, physical collocation allows a CLEC to place certain equipment necessary for interconnection in a dedicated space at the facility of an incumbent local exchange carrier ("ILEC"), like GTE. See 47 U.S.C. §251(c)(6); First Report and Order ¶¶ 555-607. The Act obligates ILECs to allow for the physical occupation by the CLEC to establish a mini-facility on

the property of the ILEC for an indefinite period with the further right to enter the ILEC's facility to install, maintain, and repair collocated equipment, as it deems necessary.

Physical collocation amounts to an installment and direct physical attachment to GTE's property. Cf. Loretto, 458 U.S. at 438. There is no question that a third party -- as opposed to GTE -- would have an exclusive property interest in the space on GTE's premises. See Id. at 440 n.19. And there is no question that, unlike in Florida Power and Yee, the Act requires an ILEC to allow third parties to physically occupy their premises. Thus, this case falls squarely within the per se takings rule of Loretto, as clarified in Florida Power and Yee.

The collocation issue has been squarely addressed by the Oregon Supreme Court, which held that physical collocation amounts to a taking by permanent physical invasion. In GTE Northwest Inc. v. Public Util. Comm'n of Oregon, 321 Ore. 458, 468-77, 900 P.2d 495, 501-06 (1995), cert. denied, 116 S.Ct. 1541 (1996), the Supreme Court of Oregon held that state-mandated collocation rules effected an unconstitutional physical taking. Id. The Court reasoned that when the government requires a physical intrusion into one's property that reaches the extreme form of a permanent physical occupation, a taking has occurred. Id.[8]

[8] The one federal court to address this issue has agreed that physical collocation "would seem necessarily to 'take' property regardless of the public interests served in a particular case." Bell Atlantic Tel. Cos. v. FCC, 24 F.3d 1441, 1446 (D.C. Cir. 1994). The D.C. Circuit did not, however, have to reach the taking issue because that court concluded that the FCC did not have the statutory authority to order physical collocation.

## 2. Unbundled Access To The Local Loop.

AT&T has requested access to the local loop on an unbundled basis. (AT&T Petition at 11, Attachment 1 at 3.) The Act provides CLECs with the right to unbundled access to the local loop. 47 U.S.C. § 251(c)(3); First Report and Order ¶¶ 226-541. As described in GTE witness Wood's testimony, GTE is forced to transfer a property interest in the loop to AT&T. That interest is more akin to a forced lease than a sale. If a customer who elects AT&T as a local telephone provider decides to switch back to GTE, then GTE would again assume the property interest given to AT&T. Once AT&T or any other CLEC assumes an interest in the local loop, however, GTE cannot provide local exchange or any other service over that wire.

The physical occupation here is very similar to the taking in physical collocation. Here, GTE's turning over of the local loop to AT&T -- by compulsion from the government -- amounts to a direct physical occupation of its property by a third party, as it did in Loretto. 458 U.S. at 438. Nor is there a question that GTE owns this property. See id. at 440 n.19. And there is no question that, unlike in Florida Power and Yee, the Act requires GTE to allow AT&T and other third parties to physically occupy its premises. This case, just like physical collocation, falls squarely within the per se takings rule of Loretto, as clarified in Florida Power and Yee.

## 3. Access To Poles, Ducts, Conduits & Rights Of Way.

AT&T has requested access to GTE's poles, ducts, conduits and rights of way. (AT&T Petition at 11, Attachment 1 at 4.) As described in the testimony of GTE witness Bailey, under Section 224, as amended by the Act, utilities are required to

provide non-discriminatory access to any pole, duct, conduit, or right-of-way owned or controlled by a utility. 47 U.S.C. § 224 (1996). The FCC has interpreted Section 224 as requiring mandatory access to GTE's facilities. First Report and Order ¶¶ 1119-1240.

After Florida Power, there can be no question that forced access to poles is also a per se physical taking. The only issue left open in Florida Power was whether there had been a forced occupation. The Supreme Court made clear that the distinguishing factor in Florida Power was that unlike the forced access in Loretto, "nothing in the Pole Attachments Act as interpreted by the FCC in these cases gives cable companies any right to occupy space on utility poles, or prohibits utility companies from refusing to enter into attachment agreements with cable operators." 480 U.S. at 251. This distinguishing factor has been eliminated by the Act and the First Report and Order, which undoubtedly require forced access to poles and thus effect a taking.

**4. Databases.**

AT&T has requested access to GTE's databases. (AT&T Petition at 10, 11, Attachment 1 at 2.) As described in the respective testimony of GTE witnesses Morris, DellAngelo, and Langley, GTE has a protected property interest in its databases, yet AT&T's proposal would allow it to obtain forced access to GTE's intellectual property. That too would constitute a taking.

There can be no question that GTE's intellectual property -- if taken without just compensation -- would constitute a taking. Rights in computer software and computer hardware are "property" protected against uncompensated takings under

the Takings Clause of the Fifth Amendment. Whether the nature of the property is the ownership of the tangible product itself, the intangible interest in the underlying data, the patent, copyright, trade secret rights, or any contractual right relating to the use of the software, each is independently protected by the Takings Clause. For example, in Ruckelshaus v. Monsanto Co., 467 U.S. 993 (1984), in which the Court held that property interests in trade secrets constituted compensable property for purposes of the Takings Clause, the Court observed:

> This general perception of trade secrets as property is consonant with a notion of "property" that extends beyond land and tangible goods and includes the products of an individual's "labour and invention." Although this Court never has squarely addressed the question whether a person can have a property interest in a trade secret, which is admittedly intangible, the Court has found other kinds of intangible interests to be property for purposes of the Fifth Amendment's Taking Clause . . . That intangible property rights . . . are deserving of the protection of the Taking Clause has long been implicit in the thinking of this Court[.]

Id. at 1003 (citations omitted); see also Lynch v. United States, 292 U.S. 571 (1934) (valid contracts are property within meaning of the Takings Clause).[9]

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It is no response to the various physical takings here that somehow GTE's interest in its real property (facilities, network, poles, ducts, or conduits) or in its intellectual property (databases) should be accorded any less respect because GTE's

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[9] See also Leesona Corp. v. United States, 599 F.2d 958 (Ct. Cl. 1979) (where government infringed patent, it was deemed to have "taken" the patent license under an eminent domain theory and entitled to just compensation under the Fifth Amendment), cert. denied, 444 U.S. 991 (1979); Ladd v. Law & Technology Press, 762 F.2d 809, 813 (9th Cir. 1985) (observing that copyrighted materials constituted private property for purposes of the Takings Clause), cert. denied, 475 U.S. 1045 (1986).

local telephone exchange business has been regulated by the Commission. A long line of cases establishes that a utility's property -- even though subject to regulation -- remains the property of the utility, not the government. See Munn v. Illinois, 94 U.S. 113, 126 (1877); Delaware, L. & W. R.R. v. Morristown, 276 U.S. 182, 193 (1928); Northern Pac. Ry. v. North Dakota, 236 U.S. 585, 595 (1915). Therefore, regulation by the Commission may alter the use of property, but it cannot alter the underlying ownership of the property for purposes of a physical taking.

Put another way, there is nothing about the relationship between GTE, as a regulated entity, and the Commission that suggests that GTE has in any way bargained away its private property rights in exchange for a franchise that it has enjoyed up until now in the local exchange market in its service territory. AT&T has provided no evidence -- and it will be unable to provide any evidence -- of any agreement by GTE to give up its private property rights in its network facilities. The only bargain that GTE has entered into has been to provide quality universal telephone service to the customers of Florida in exchange for an exclusive franchise that would allow for a recovery of and a fair rate of return on its invested capital. Never has GTE turned over any part of its property rights to the State.

To the contrary, GTE has preserved all the traditional incidents of private ownership of its network property -- including title, possession, and the right and obligation to incur debt to finance that property, to depreciate it, and to pay taxes on it. Any suggestion that GTE does not have a full property interest in its property would be news to state and federal taxing authorities, to GTE's creditors, and to its shareholders.

Therefore, GTE is entitled to just compensation for the physical occupation and taking of its property. While recovery of the fair market value is typically the measure of just compensation for a taking, see, e.g., United States v. 564.54 Acres of Land, 441 U.S. 506, 515-17 (1979), the Supreme Court has long recognized that there is no "rigid rule" requiring that standard. United States v. Commodities Trading Corp., 339 U.S. 121, 123 (1950). Thus, where a "market value", as here, would be "difficult to find," other standards may be appropriate. Again, the guiding principle is that the property owner should be put in "as good a position pecuniarily as if his property had not been taken." Olson, 292 U.S. at 255. Here, that means allowing GTE all of its forward looking costs pursuant to the "market-determined efficient component pricing rule" ("M-ECPR") (as discussed in greater detail in Part III.A below) and a recovery of and a fair rate of return on its historic costs of creating the network that has been taken (Part III.C below). Here, the measure of just compensation for a physical taking is no different from the compensation owed GTE under the regulatory/confiscatory pricing analysis discussed above (Part II.A).

## III. GTE MUST RECOVER ALL ITS FORWARD-LOOKING COSTS AND EARN A FAIR RATE OF RETURN ON ITS HISTORIC COSTS.

In Parts I and II above, we explained how AT&T's Petition would effect an unconstitutional taking and why the FCC's First Report and Order provides no safe harbor for that taking. In this Part, we apply these takings principles to this arbitration and demonstrate that GTE must recover its full forward-looking costs (Part III.A) and historic costs (Part III.B) to avoid an uncompensated and unconstitutional taking.

### A. There are Five Forward-Looking Costs That GTE Must Recover.

#### 1. Incremental Costs.

For any piece of GTE's network that is either leased or sold, it is commonly accepted that GTE is entitled to its long run incremental cost. In its First Report and Order, the FCC adopted this principle by establishing a pricing methodology for interconnection and unbundled elements based on the TELRIC of providing a particular network element plus a reasonable share of forward-looking joint and common costs. First Report and Order ¶¶ 674-703. Under AT&T's pricing proposal, however, GTE would not even recover its incremental cost in some cases. (See testimony of GTE witness Sibley and associated Report.) Where GTE's incremental cost is higher than its retail rate (in the case of residential service, for example), forcing GTE to sell at "retail" would effect an unconstitutional taking in the absence of some other mechanism to make GTE whole. (Sibley testimony and Report.) That is to say, even the retail price does not fully cover GTE's incremental costs. Even worse, forcing GTE to sell at a price that is less than retail -- in the case of wholesale rates, for example -- would only make the taking more pronounced. (Id.)

#### 2. All Forward-Looking Joint And Common Costs.

To the extent that AT&T's Petition allows for GTE to receive anything less than the full recovery of all forward-looking joint and common costs for any piece of GTE's network that is either leased or sold, it would be a taking without just compensation.[10] Even the "reasonable" portion of joint and common forward-looking

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[10] A firm's "joint" costs are those costs incurred when two or more services are (continued...)

costs that would be permitted under the FCC's interpretation, however, would be insufficient. The First Report and Order suggests two permissible methods of calculating the "reasonable" portion -- both of which would subsidize AT&T's entry into the market by ensuring that GTE earned only a portion of its forward-looking joint and common costs. First Report and Order ¶ 696. (Both methods are explained in more detail in Dr. Sibley's report.)

Under one method, GTE would only be entitled to a fixed markup, which would mean that GTE would be forced to forego a significant share of the contribution it otherwise would have earned. Under the other method, the FCC would "allocate" GTE's forward-looking common costs to the elements that are the most competitive and, therefore, least likely to recover their assigned costs. As explained in greater detail in the Report submitted by Dr. Sibley, both methods would foreclose the possibility that GTE would be able to achieve the recovery of forward-looking costs that the FCC purports to endorse, and would effect an unconstitutional taking without just compensation. AT&T has failed to explain how this basic constitutional defect would be rectified.

Taking a position that is even more aggressive than the FCC, AT&T appears to assume that forward-looking costs are exactly equal to the sum of GTE's TELRICs. That is to say, AT&T's pricing proposal appears to be based on the

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[10](...continued)
produced in fixed proportion. A firm's "common" costs are those costs incurred in the provision of some or all the firm's services that are not incremental to any individual service. Common costs can only be "avoided" by shutting down the entire firm or by not producing a particular group of services under review. (See Sibley Report.)

erroneous proposition that joint and common costs are de minimis in the provision of local telephone service. AT&T has -- once again -- offered no evidence to support this claim. Moreover, AT&T's proposal conflicts with the FCC's interpretation, which assumes there will be some forward-looking joint and common costs that an ILEC is entitled to recover. See First Report and Order ¶¶ 672-73, 694-98.

**3. GTE's Costs Of Subsidizing Other Services.**

It has long been a fundamental tenet of regulation of local telephone service that the incumbent LEC bears certain burdens -- notably, rate structures that reflect cross subsidies from universal service and carrier of last resort obligations. These burdens, unique to the incumbent, come at a tremendous cost. GTE has explained elsewhere in its submission (Sibley testimony and Report) that these costs are certain and quantifiable. Yet AT&T's Petition seeks to avoid any responsiility for paying for these costs. Instead, without any basis whatsoever, they would force the incumbent to bear these costs. If the Commission were to force GTE to bear these costs, that would constitute an uncompensated, unconstitutional taking.

The cost of the subsidy, or "contribution" is particularly severe when considering the sale or lease of an unbundled element (the local loop, for example). If the price of the loop is set too low, then GTE will not recover its full costs associated with the loop, as discussed in greater detail Dr. Sibley's Report. But even worse, GTE will also lose the opportunity to sell other higher-margin services that provide contribution toward universal service and carrier of last resort obligations. So, when GTE sells/leases an unbundled loop to AT&T, for example, AT&T will likely self-provision the switching facilities necessary to provide higher-margin vertical services.

Yet these are precisely the higher-margin vertical services that provide contribution to GTE's costs that traditionally served to keep basic telephone rates low. Thus, the more GTE and other ILECs lose the opportunity for contribution, the more compelling is the case that AT&T's proposal would effect a taking. By contrast, the market-determined efficient component pricing rule, as explained in detail in Dr. Sibley's Report, derives a mechanism that prices GTE components at their economic costs. This price rule, supplemented with a competitively neutral surcharge, is the proper -- and constitutional -- method for compensating GTE.

It is no answer to a taking that there may be alternate funding available at some later point through a universal service fund ("USF"). 47 U.S.C. § 254. Indeed, the very fact that Congress has recognized that there is a need for the USF only underscores why there would be an unconstitutional taking if AT&T's proposal were adopted. The whole point of the USF is that Congress recognized that local telephone service has been subsidized by allowing higher-priced services -- like toll calling, business service, vertical services (voice mail, caller identification, call forwarding etc.) -- to keep rates low for preferred classes of customers. Yet that is precisely what is at issue here. Moreover even if this were somehow an answer (and it is not), it would only be a partial answer because the USF is designed to recover only a limited portion of historical and forward-looking costs. And, in addition, the USF will not go into effect for quite some time -- which would leave GTE uncompensated until that time and wrongfully leave the burden on GTE to bring a separate action to recover those lost funds.

**4. GTE's Costs Of Unbundling And Resale.**

As described in more detail elsewhere in GTE's submission (Testimony of GTE witnesses Wood, Wellemeyer, and Sibley, respectively), unbundling and resale entail economic costs -- both direct production costs and transaction costs. There is no justification for compelling GTE to bear these costs, and AT&T has offered no rational explanation for doing so. To be sure, AT&T would no doubt prefer GTE to bear these costs, but the Constitution requires that GTE be compensated for these additional costs. These are real costs that will be no less if GTE bears them, as opposed to AT&T.

**5. Prohibition Against Overstated Avoided Costs.**

With respect to resale, the Takings Clause prohibits the use of overstated avoided costs to drive down the wholesale price, as AT&T would like to do. Under the Act, the Commission must establish a rate for the resale of telecommunications services pursuant to 47 U.S.C. § 251(c)(4). The Act provides for a pricing methodology based on the ILEC's wholesale rates, which are established by taking the retail rate less the avoided costs. 47 U.S.C. § 252(d)(3) (1996). The FCC has issued regulations in which it identifies a number of "avoided costs," but leaves to the States the application of this definition. First Report and Order ¶¶ 907-10.

As explained above (Part I), the FCC has also provided a default range of discount rates (17-25%) from the retail price. Id. And the FCC's proposed range would require GTE to sell its services below cost. As such, these proposed discount rates are insufficient to allow GTE to recover its costs associated with providing its various services subject to resale pursuant to the Act. Instead, the Commission should opt to

implement a wholesale rate formula consistent with M-ECPR. (Sibley Report.) Anything less would be an unconstitutional, confiscatory taking.

If the Commission were to adopt the even more excessive, overstated "avoided costs" proposed by AT&T, then that too would amount to a taking. AT&T's overstated "avoided cost" assumes (incorrectly) that GTE would leave the retailing business entirely and that any lost sale has a corresponding, equal per-unit reduction in avoided costs of retailing (marketing, advertising, and billing). Thus, under AT&T's overreaching method, for example, if GTE produced 100 units and its cost of retailing, marketing, and billing were $20, then AT&T would propose that the avoided costs on each unit would be $0.20 (i.e., $20 ÷ 100 units = $0.20). Under AT&T's theory, if GTE sold 50 units at resale, its cost savings would be exactly ½ of $20 (or $10), and if it sold 100 units at resale, its avoided costs would be the full $20. That is to say, every unit of service has a corresponding, equal unit of retailing costs.

This does not, however, properly represent GTE's actual avoided costs. Consider, for example, one element of retailing costs -- advertising. AT&T's improper avoided-cost proposal would reduce GTE's advertising expenditures in direct proportion to the units of resale service provided. In reality, though, GTE's advertising dollars would probably be unaffected by the provision of resale services, unless of course GTE were to exit the retail business entirely -- which, of course, is the logic behind AT&T's incorrect analysis.

An equally flawed corollary to AT&T's improper method is the argument that GTE subtract an additional amount from its retail rate because it is supposedly spending too much at the retailing level and must be making excess economic profit.

Of course, neither AT&T nor anyone else has offered evidence supporting this theory, which would be pure speculation and a denial that regulation has managed to control GTE's costs. Moreover, it would run counter to the strong incentives GTE has to hold down its costs under price-cap regulation.

In fact, AT&T's entire position on resale appears to be motivated by its desire to take advantage of GTE's position as the incumbent and engage in "cream skimming" tactics – choosing no doubt to build facilities in high-margin areas. AT&T will most likely leave the job of serving high-cost areas to GTE. That is to say, it will rely on resale to build out its system, while avoiding all of the costs associated with a facilities-based network in the low-margin areas while GTE will retain universal service and carrier-of-last-resort obligations. Congress no doubt did not intend for competitors like AT&T to be able to engage in such strategic behavior.

### B. GTE Must Be Allowed A Reasonable Return on Its Historic Costs.

AT&T's proposal forbids the recovery by GTE of **any** return on its historic, or embedded costs in building the very network with which it now seeks interconnection. Yet, it has long been settled that the Takings Clause requires a fair rate of return for regulated utilities on their investments. See, e.g., Duquesne, 488 U.S. 299. The question for regulators has traditionally been "On which investments is the utility entitled to a fair rate of return?" In his concurrence in Duquesne, Justice Scalia correctly concluded that for purposes of determining whether a taking has occurred, all "prudently inccurred investment[s] may well have to be counted." Id. at 317. That is to say, at a minimum, the Commission must include **all** prudently incurred investments by GTE in constructing the very network that the government would now take from the

Company for the use of third parties. Thus, GTE is entitled to recover that portion of its historic costs not yet recovered and to earn a fair rate of return on those investments.

AT&T has presented no evidence demonstrating that GTE's investments in constructing the local exchange network were not prudently incurred or should be excluded. Nor could it, for those very investments were the subject of close regulatory scrutiny by this very Commission. Thus, to the extent that AT&T now seeks access to GTE's network, it should have to either pay for an appropriate share of (and return on) those historic costs or GTE should otherwise be made whole through a rate rebalancing, end user charge, or one-time payment that would account for the monies prudently spent by GTE but now stranded by the transition from regulation to competition.

If the Commission were to afford GTE anything less than a fair rate of return on the very historic costs that the Commission induced GTE to spend to create the local exchange network, it would also run afoul of the principle that a regulator may not switch "back and forth between methodologies in a way which required investors to bear the risk of bad investments at some times while denying them the benefit of good investments at others". Duquesne, 488 U.S. at 315. Indeed, given that the "end result" test in Duquesne has no application where there has been a transition, as here, from regulation to competition, then the Commission's close scrutiny of each element of GTE's expenditures -- including historic, sunk costs -- is compelled by longstanding case law requiring a fair rate of return for a regulated utility.

Thus, the Commission needs to adjust its calculations to either the rate base or to future rate of return to reconcile its obligations to GTE. Alternatively, it may

prefer to address this issue in a franchise-impact proceeding. The central issue though remains the same -- GTE must receive fair compensation; the method by which that happens is secondary.

## Conclusion

For all of the reasons described above and elsewhere in our response, the Commission must avoid an unconstitutional taking of GTE's property without just compensation by ensuring that GTE will recover its forward-looking costs and any portion of its historic costs not yet recovered and earn a fair rate of return on that investment.

# GTE's PREHEARING MASTER MATRIX OF ISSUES AND POSITIONS

This matrix sets forth the major issues raised in the arbitration, and summarizes each party's position. It also includes references to other GTE materials where the issues are discussed in detail.

The matrix and the issues are organized by subject matter as follows:


I. COMPETITION POLICY ..... 2

II. COSTING METHODS AND PRICING ..... 4

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## I. COMPETITION POLICY

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **What would happen to the local exchange market if AT&T's wishes were granted?** | AT&T would be unfairly advantaged and competition would be harmed.<br><br>AT&T will have succeeded in obtaining GTE's service and unbundled elements below GTE's cost.<br><br>AT&T will have obtained this singular benefit at the expense of customers and shareholders of incumbent local exchange companies like GTE because its position is that GTE should subsidize AT&T by paying the cost of solving all of AT&T's transition issues. The result will compound the injury to GTE, because AT&T -- with its artificially low cost structure -- will have an unfair competitive advantage. | Part XIII. | |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **What should be the term of the first agreement during the transition period?** | The term of the agreement should not be greater than two years.<br><br>The Act did not intend to place permanent long term disabilities on the ILECs or ALECs but to foster competition by opening the market to AT&T and others. Shorter-term agreements are pro-competitive, especially in a rapidly changing market. | Part XIII. | The interconnection agreement should be binding on GTE for five years. |
| **Should the agreement be implemented without impairing GTE's right to file tariffs in the normal course of business?** | Yes. The Commission should be permitted to continue to consider tariffs as and when they are filed. | Part XIII. | No. |
| **Should GTE be required to guarantee AT&T's local service revenue if GTE's network or services fail in any respect?** | No. GTE should not be required to insure collection of all revenues lost as a result of alleged "failures" in the GTE network or systems. The rates and cost studies presented by GTE do not include the cost of insuring against AT&T's risk of doing business. | Part XIII. | GTE should indemnify AT&T for lost revenues in the form of unbilled or uncollected items. |

## II. COSTING METHODS AND PRICING

| GTE ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **How should the cost of interconnection and unbundled network elements be measured?** | The Act recognizes that pricing must cover all of the ILEC's costs including a reasonable share of joint and common costs. Even the FCC agrees that a TELRIC methodology does not recognize such costs. The parties disagree about how to measure TELRIC, and also about whether GTE is entitled to recover its joint and common costs.<br><br>GTE's proposal is consistent with the Act and recognizes a reasonable share of joint and common costs. The rates derived from GTE's proposal are presented in GTE's Response.<br><br>The "Hatfield model" proposed by AT&T cannot validly be applied to determine costs of unbundling and interconnection for GTE's network. It is a theoretical model that does not reflect real-world costs. | Part VIII;<br>Part IX.<br><br>Part XII;<br>Part IX;<br>Part VIII;<br>Part I;<br>Part IV. | The "Hatfield model" should be used to develop TELRIC rates for GTE's particular network.<br><br>The "Hatfield model" should be used to develop GTE's specific rates for unbundled network elements and interconnection. |
| **Should rates for transport and termination be symmetrical?** | No. The FCC has no authority to require symmetrical rates.<br>In any case, symmetrical pricing is not appropriate because it makes unwarranted assumptions. Rates should be based on each entity's own costs. | Part IV;<br>Part IX. | Yes. |

| GTE ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Should bill-and-keep be used as a reciprocal compensation arrangement for transport and termination on a temporary or permanent basis?** | GTE should not be required to use a bill-and-keep arrangement, either initially or permanently. However, as GTE and AT&T continue negotiations, GTE would be willing to discuss with AT&T a method to assume that traffic is in balance in order to apply bill-and-keep initially. But if and when traffic is out of balance, bill-and-keep is not appropriate, and intrastate access rates should be used. | Part IV. | Bill-and-keep should be used for 12 months as a method of setting interconnection charges. |
| **What method should be used to price interim number portability? What specific rates, if any, should be set for GTE?** | GTE should recover its total costs for providing interim number portability. New entrants can allocate or recover their costs as they choose. GTE's costs for interim number portability should be determined based on the network in place today, and allowing for capital, transport and termination, and opportunity and investment costs. The rates presented by GTE should be adopted. | Part IX. See cost study. | Interim number portability should be priced at rates requested by AT&T pursuant to its version of TELRIC. |
| **What method should be used to price collocation? What specific rates, if any, should be set for GTE?** | Collocation rates should allow for recovery of common costs, as required by the Act. GTE's proposed prices reflect this requirement. | Part IX. See cost study. | Collocation rates should be set at TELRIC using AT&T's method. |

## III. RESALE PRICING -- AVOIDED COST METHODOLOGY

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **What is the proper methodology for determining the prices for GTE's resold services?** | Wholesale prices should be based on avoided, not avoidable, costs. Thus, prices for resold services should equal retail rates minus actual avoided costs plus additional wholesale costs plus opportunity costs, if any.<br><br>The FCC methodology is flawed technically and is contrary to the Act because it measures avoidable costs. This would effect an unconstitutional taking. This Commission is not required to use the FCC's proposed methodology. The Act reserves to the State the exclusive authority to set wholesale rates.<br><br>Nevertheless, if the FCC's proposal were followed (which GTE disputes) GTE's rates should be determined according to the modified avoided cost study that it submits in the alternative. | Part VII. | The discount for resale on a wholesale basis should be determined on the basis of avoidable rather than avoided cost. |
| **What GTE services should be required to be made available for resale at wholesale rates?** | GTE will make available retail services on a wholesale basis except for below-cost services, promotional services and several other services described in GTE's response. | Part VII. | GTE should be required to make all of its retail telecommunications services available for resale at wholesale rates. |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Should access to pay phones be made available for resale?** | GTE will agree to provide COCOT line coin services under terms called for by applicable tariffs.<br>GTE will not provide end-user public phone service for resale because GTE does not offer that service at retail. | See GTE's Proposed Contract | GTE should provide all types of pay phone line service at wholesale prices with access to maintenance diagnosis. |
| **How should the provisions of the Act be applied to OS and DA services?** | According to the Act, GTE will sell those OS/DA items that it sells now at retail, and it is not required to unbundle portions of OS/DA that are not sold separately at retail. GTE will provide those aspects of OS/DA that it currently offers at retail along with local service at just and reasonable rates for its avoided costs.<br>AT&T avoids this issue by seeking OS/DA as an unbundled item, which would require customized routing. | Part I;<br>see cost study. | AT&T seeks OS/DA as an unbundled item. |
| **Should GTE be required to accommodate AT&T's branding requests concerning operators and directory assistance?** | GTE should not be required to accommodate AT&T branding requests for OS and DA.<br>AT&T ignores the costs of and technical limitations on providing facilities necessary to enable GTE to meet ALECs' branding demands. | Part I. | If OS/DA is not unbundled from local service, AT&T's brand should be provided when AT&T customers access GTE's service. |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Should the Commission adopt the FCC's "default proxy" discount rates?** | No. First, this Commission has the duty to establish wholesale rates under the Act and the FCC exceeded its statutory authority in attempting to preempt states on this matter.<br><br>Second, the FCC "default proxy" rates are below cost and should not be applied even temporarily to GTE. They are based upon an invalid methodology and would constitute a taking.<br><br>GTE's cost studies demonstrate that the default rates do not meet GTE's costs. GTE's cost studies provide the discount rates that should be approved by the Commission.<br><br>The Commission should decline to apply default proxy rates even on an interim basis. There would be an irreversible harm to GTE in loss of market share if the wrong rates were applied on an interim basis. | Part VII;<br>Part XIII. | The default proxy rates should be assigned to the resale services to be provided by GTE on a interim basis, after which the Commission should apply rates based upon an avoidable, not avoided cost methodology. |

## IV. UNBUNDLING NETWORK ELEMENTS -- FEASIBILITY AND COST ISSUES

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **What unbundled network elements should be provided to AT&T?** | GTE will unbundle the network and provide AT&T the following elements:<br>• Loops (In general, the transmission facility which extends from a main distribution frame to the customer premises.)<br>• Ports (In general, the line card and associated peripheral equipment on a GTE end office switch that serves as the hardware termination for the customer's exchange service on that switch and generates dial tone and provides the customer a pathway into the public switched telecommunications network.)<br>• Transport (In general, the transmission facility which extends from a main distribution frame (MDF) to either another MDF or a meet point with transport facilities of AT&T. Unbundled transport is provided under rates, terms and conditions of the GTE EIS tariff.) | Part I;<br>Part II;<br>Part IV;<br>Part XIII. | GTE should provide the following twelve items as if they were separate network elements:<br>NID<br>Loop distribution<br>Loop concentrator/ multiplexer<br>Loop feeder<br>Local switching<br>Operator Systems/ Directory Assistance (OS and DA)<br>Dedicated transport<br>Common transport<br>Tandem switching<br>Signaling links/transport<br>Signal transfer points<br>Service control point/ databases |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| | • Signaling system. (GTE has offered to make available SS7 signaling and transport service in support of AT&T's local exchange service.)<br>• Databases (Access to GTE's 800/888 database and LIDB services shall be provided in accordance with the rates, terms and conditions of GTE's switched access tariff.)<br>AT&T may lease and interconnect to whichever of these unbundled network elements AT&T chooses, and may combine these unbundled elements with any facilities or services that AT&T may itself provide, pursuant to the following terms:<br>• Interconnection for access to unbundled elements shall be achieved via expanded interconnection/collocation arrangements AT&T shall maintain at the wire center at which the unbundled services are resident.<br>• Each loop or port element shall be delivered to AT&T collocation arrangement over a loop/port connector applicable to the unbundled services through other tariffed or contracted options.<br>• AT&T may combine unbundled network | | |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| | elements with AT&T's own facilities. AT&T shall not combine unbundled network elements purchased from GTE to bypass GTE's resale offerings. | | |
| *Subloop Unbundling* | AT&T's wish to unbundle separate loop items (loop distribution, loop concentrator, loop feeder) ignores the substantial cost of breaking them out into separate items. GTE will agree to provide as separate items the loop distribution, loop concentrator, and loop feeder on an individual case-by-case basis where feasible, and only if AT&T pays the cost of providing them separately. | Part I. | Loop distribution, loop concentrator, and loop feeder should be broken out into separate elements that can be provided separately. |
| *The Port* | GTE will provide the port, as described above. AT&T wants access to switch functions and features that go beyond the notion of unbundling contemplated by the Act.<br>Unbundling the switch as AT&T requests has numerous feasibility problems at this time. It further ignores the limitations on switch capacity and the substantial cost of modifying existing switches. Unbundling these switch items would prevent GTE from identifying calls routed to an IXC; therefore, AT&T would be able to avoid paying access charges, which the Act requires to be paid. | Part I. | AT&T wants to unbundle all of the switching functions without paying for the unbundling. |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Should AT&T obtain access to the functionality of GTE's AIN by whatever pathway and means that it desires?** | No. The AIN trigger is not a network element. Moreover, AT&T can obtain access to the full functionality of GTE's AIN by reaching it through GTE's gateway. Providing AT&T a direct link between GTE's triggers and AT&T's platform would be unnecessary to providing full functionality, endanger the integrity of the GTE network and raise the risk of system faults. | Part III. | AT&T should be permitted to interconnect its own AIN platform to GTE's SS7 network by reaching particular "triggers." |
| **Is breaking out the SS7 system into separate unbundled "elements" technically feasible?** | Unbundling the SS7 system itself into discrete parts is not currently technically feasible, and would jeopardize the integrity of the network. Further, there are no technical standards for doing so.<br><br>GTE has offered interconnection with its SS7 system at the signal transfer points (STP), but not at other points. Access to the service control points (SCP) and associated databases is technically feasible at this time only through the STP pair associated with that SCP. AT&T must pay for the work and the access. | Part II. | SS7 should be broken apart and provided as 1) signaling links, 2) STPs and 3) SCP. |
| **Should data switches be an "unbundled" element for transporting data between networks using network-to-network interfaces (NNIs)?** | GTE has agreed to unbundled access at the NNI level only on a case-by-case negotiated agreement basis due to potential protocol interface differences that may exist between network technologies. | Part I. | AT&T wishes to have unbundled access to GTE's gateways. |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| *Operator Systems* | | | |
| **Is it technically feasible to establish separate trunk lines for routing calls exclusively to AT&T's OS/DA?** | Not without a large and unknown expenditure. Current switch limitations would require adding new capacity and conditioning existing switches. GTE should not be required to provide direct routing to AT&T OS/DA platforms on GTE's network for AT&T customers. GTE would agree on a short-term, interim basis to implement certain customized routing if AT&T agrees to pay all associated costs. Ultimately, a long-term industry standard solution must be established. | Part I. | GTE should provide "routing elements" as part of an unbundled switch.<br><br>This should include direct routing. |
| **Should GTE be compelled to provide access to the directory assistance database for the purpose of AT&T providing branded DA?** | Difficult problems arise involving access to a secure database by multiple users. GTE would have to modify the database to provide, for example, for continued security, and a gateway necessary to make access feasible. The problems of system modifications and cost recovery would have to be solved before providing access. | Part I. | Yes. |
| *Operations Support Systems* | | | |
| **Should GTE be required to absorb the cost of access to OSS?** | AT&T should pay the cost of access to OSS. | Part X. | Yes. GTE should absorb the cost of AT&T's access to OSS. |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Must GTE provide AT&T access to OSS through electronic interfaces?** | No. AT&T's means of seeking electronic bonding are unreasonable. GTE will provide nondiscriminatory access to GTE OSS functions that are available to GTE, but it need not provide "on-line" access to the GTE systems themselves. | Part X. | Yes. GTE must provide AT&T access to OSS via electronic interfaces. |
| **On what basis should OSS electronic interfaces be implemented?** | GTE has identified workable means to provide them, but the timing of implementation and the responsibility of AT&T for the cost remain open issues.<br>Long-term implementation of securing electronic interfaces to GTE's OSS functions should be reasonably based upon the actual work required to create the necessary electronic bonding between the systems. AT&T should pay GTE's cost. | Part X. | Interim interfaces should be developed while permanent interfaces are established, at GTE's cost. |
| **Should AT&T have access to GTE's unused transmission media ("dark fiber")?** | No. The unused fiber is not a network element because it is not "used in the provision of a telecommunications service." | | Unused transmission media must be made available. |
| **Should AT&T be permitted to rebundle components of GTE's network elements to replicate any service GTE offers for resale?** | No. Such a recombination of GTE's unbundled elements would destroy the distinction in the Act between resale and unbundled elements. It would allow AT&T to avoid access charges. | Part XIII. | Yes. |

## V. INTERCONNECTION -- FEASIBILITY AND COST ISSUES

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Does it meet the terms of the Act for AT&T to connect with GTE at the minimum technically feasible points required by the FCC?** | Yes. Interconnection can be required only if it is technically feasible, if it will not threaten the security and reliability of GTE's system, and if GTE's costs are fully recovered. | Part IV. | AT&T desires to interconnect wherever it wishes. |
| **Will GTE provide common and dedicated transport to AT&T?** | Yes. GTE will treat dedicated transport as a single item and make it available out of the access tariff. In addition, common transport is available out of the access tariff.<br><br>AT&T treats transport elements as an item to unbundle, whereas they actually are interconnection items to which AT&T may have access. | Part IV. | Dedicated and common transport should be unbundled. |
| **Should GTE be required to provide tandem-to-tandem switching for the purpose of terminating AT&T traffic?** | GTE will provide tandem switching if AT&T interconnects at the GTE tandem, but will not provide tandem-to-tandem switching until such time as it has the capability of identifying the traffic for billing purposes. The problem requires industry-wide cooperative agreements, which are available to AT&T. | Part IV. | AT&T should be permitted to switch traffic tandem-to-tandem on GTE's network. |

## VI. INTERIM NUMBER PORTABILITY

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **How should GTE provide interim number portability?** | GTE should provide this portability through remote call forwarding and direct inward dialing. | Part XI. | Through remote call forwarding, direct inward dialing, route indexing, LERG reassignment. |

## VII. COLLOCATION

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **When and in what circumstances should collocation be permitted?** | AT&T should be permitted to collocate only equipment that is technically necessary for basic transmission, not enhanced or customer premises equipment. | Part V. | AT&T should be permitted to collocate equipment anywhere within GTE's network or on GTE premises. |
| | AT&T should be permitted to collocate at central offices, service wire centers and tandem switches, not at vaults or manholes, and not at remote units unless a given unit offers routing or rating capability and has sufficient space. | Part V. | |
| | The Act does not require GTE to permit collocators to cross-connect in order to bypass GTE's network. | Part V. | Cross connection by collocators should be allowed. |
| | GTE may require implementation of reasonable security measures to protect equipment and facilities of GTE and other collocators. | Part V. | |

## VIII. POLES, DUCTS AND RIGHTS-OF-WAY

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Should AT&T have unlimited access to GTE's poles, ducts, conduits and rights-of-way be without regard to GTE's own needs and other logistical considerations?** | No. Requiring such unconstrained access to poles, conduits, ducts and rights-of-way would be an unconstitutional taking. Access to physical facilities should be denied also for reasons of safety, capacity and reliability and for engineering purposes. | Part VI. | Yes. |
| **Does the term "rights-of-way" in Act section 224 include all possible pathways for communicating with the end user?** | No. Section 224 does not contemplate access to all conceivable "pathways" like entrance facilities, telephone closets, cable vaults, and the like. | Part VI. | Yes. |
| **May GTE reserve space for its future use on/in its poles, ducts, conduits and rights-of-way?** | Yes. GTE's basic ownership rights over and in its poles, conduits and ducts, and rights-of-way include the right to reserve space for future use by itself. | Part VI. | No. |

## IX. MISCELLANEOUS ISSUES

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Should GTE be compelled to provide an unlimited number of directory pages to AT&T for use as branded service information?** | No. GTE has the right to control the content of its own publications. | | Yes. |
| **Must GTE provide different quality standards for AT&T?** | No. Whereas AT&T wishes to have GTE meet unique standards for all services to AT&T LEC customers, GTE will provide services on a non-discriminatory basis, in compliance with existing Commission rules. | Part X. | Yes. GTE should provide the precise quality standards that AT&T requests. |
| **How will PIC changes be made for AT&T's local customers?** | GTE should be permitted to make PIC changes for AT&T customers if changes are required.<br><br>AT&T should use the existing mechanized process for long-distance PIC changes. | Part X. | Only AT&T should provide PIC changes for its customers.<br><br>GTE should be required to accept a simplified change form.<br><br>GTE's wholesale bill should identify PIC changes separately. |

| ISSUE | GTE POSITION | GTE REFERENCES | AT&T POSITION |
|---|---|---|---|
| **Must GTE provide customer account information to AT&T, without proper customer authorization?** | No. GTE's customer information is proprietary (CPNI) under the Act, and should not be disclosed without authorization. | Part X. | "As is" changes should be permitted, with AT&T indemnifying GTE for unauthorized disclosure of CPNI. |
| **Should GTE be compelled to make secondary distributions of directories to AT&T's customers without charge?** | No. Not without charging AT&T for the extra directories distributed. Refer to GTE's cost study, which does not include these additional costs. | See cost study. | Yes. |
| **Should GTE be compelled to perform loop testing on every new line under AT&T's standard of acceptance, and provide reports of test results to AT&T?** | In a resale environment, GTE is responsible for the quality of service, and will provide service levels to AT&T's customers that are the same as those provided to customers of other ALECs and GTE. GTE will ensure its network meets the parameters, but will not provide AT&T with parameter information for concurrence or prior validation. GTE does not routinely test every loop on a new installation, but tests according to internal standards. If AT&T raises this question in an unbundling context, then it is AT&T that needs to notify GTE of the service enhancing technologies it intends to use, so that it does not interfere with GTE or other multiple users. | Part I; see, GTE's Proposed Contract. | AT&T wishes to have the complete results of loop testing. |

# GLOSSARY

**The following definitions are taken from Section 153 of the Telecommunications Act of 1996 and the FCC's First Report and Order. Some of the definitions taken from the FCC's First Report and Order apply to only certain FCC rules, and these rules are referenced in the appropriate definitions. GTE does not agree with all of the FCC's definitions, such as the FCC's definition of 'technically feasible', but these definition are provided here for convenience. Moreover, some of the definitions listed here may be inconsistent with State law.**

* * *

**Act.** The Communications Act of 1934, as amended.

**Advanced intelligent network.** "Advanced Intelligent Network" is a telecommunications network architecture in which call processing, call routing, and network management are provided by means of centralized databases located at points in an incumbent local exchange carrier's network.

**Arbitration, final offer.** "Final offer arbitration" is a procedure under which each party submits a final offer concerning the issues subject to arbitration, and the arbitrator selects, without modification, one of the final offers by the parties to the arbitration or portions of both such offers. "Entire package final offer arbitration," is a procedure under which the arbitrator must select, without modification, the entire proposal submitted by one of the parties to the arbitration. "Issue-by-issue final offer arbitration," is a procedure under which the arbitrator must select, without modification, on an issue-by-issue basis, one of the proposals submitted by the parties to the arbitration.

**Billing.** "Billing" involves the provision of appropriate usage data by one telecommunications carrier to another to facilitate customer billing with attendant acknowledgments and status reports. It also involves the exchange of information between telecommunications carriers to process claims and adjustments.

**Commission.** "Commission" refers to the Federal Communications Commission.

**Common carrier.** The term "common carrier" or "carrier" means any person engaged as a common carrier for hire, in interstate or foreign communication by wire or radio or in interstate or foreign radio transmission of energy, except where reference is made to common carriers not subject to the Act [47 USC §§ 151 et seq.]; but a person engaged in radio broadcasting shall not, insofar as such person is so engaged, be deemed a common carrier.

**Customer premises equipment.** The term "customer premises equipment" means equipment employed on the premises of a person (other than a carrier) to originate, route, or terminate telecommunications.

**Dialing parity.** The term "dialing parity" means that a person that is not an affiliate of a local exchange carrier is able to provide telecommunications services in such a manner that customers have the ability to route automatically, without the use of any access code, their telecommunications to the telecommunications services provider of the customer's designation from among 2 or more telecommunications services providers (including such local exchange carrier).

**Directory assistance service.** "Directory assistance service" includes, but is not limited to, making available to customers, upon request, information contained in directory listings.

**Directory listings.** "Directory listings" are any information: (1) identifying the listed names of subscribers of a telecommunications carrier and such subscriber's telephone numbers, addresses, or primary advertising classifications (as such classifications are assigned at the time of the establishment of such service), or any combination of such listed names, numbers, addresses or classifications; and (2) that the telecommunications carrier or an affiliate has published, caused to be published, or accepted for publication in any directory format.

**Downstream database.** A "downstream database" is a database owned and operated by an individual carrier for the purpose of providing number portability in conjunction with other functions and services.

**Equipment necessary for interconnection or access to unbundled network elements.** For purposes of section 251(c)(2) of the Act, the equipment used to interconnect with an incumbent local exchange carrier's network for the transmission and routing of telephone exchange service, exchange access

service, or both. For the purposes of section 251(c)(3) of the Act, the equipment used to gain access to an incumbent local exchange carrier's unbundled network elements for the provision of a telecommunications service.

**Exchange access.** The term "exchange access" means the offering of access to telephone exchange services or facilities for the purpose of the origination or termination of telephone toll services.

**Incumbent Local Exchange Carrier (Incumbent LEC).** With respect to an area, the local exchange carrier that: (1) on February 8, 1996, provided telephone exchange service in such area; and (2) (i) on February 8, 1996, was deemed to be a member of the exchange carrier association pursuant to 47 C.F.R. § 69.601(b); or (ii) is a person or entity that, on or after February 8, 1996, became a successor or assign of a member described in clause (i) of this paragraph.

**Interconnection.** "Interconnection" is the linking of two networks for the mutual exchange of traffic. This term does not include the transport and termination of traffic.

**Local access and transport area.** The term "local access and transport area" or "LATA" means a contiguous geographic area--

(A) established before the date of enactment of the Telecommunications Act of 1996 [enacted Feb. 8, 1996] by a Bell operating company such that no exchange area includes points within more than 1 metropolitan statistical area, consolidated metropolitan statistical area, or State, except as expressly permitted under the AT&T Consent Decree; or

(B) established or modified by a Bell operating company after such date of enactment and approved by the Commission.

**Local Exchange Carrier (LEC).** A "LEC" is any person that is engaged in the provision of telephone exchange service or exchange access. Such term does not include a person insofar as such person is engaged in the provision of a commercial mobile service under section 332(c) of the Act, except to the extent that the Commission finds that such service should be included in the definition of the such term.

**Maintenance and repair.** "Maintenance and repair" involves the exchange of information between telecommunications carriers where one initiates a request for maintenance or repair of existing products and services or unbundled network elements or combination thereof from the other with attendant acknowledgments and status reports.

**Meet point.** A "meet point" is a point of interconnection between two networks, designated by two telecommunications carriers, at which one carrier's responsibility for service begins and the other carrier's responsibility ends.

**Meet point interconnection arrangement.** A "meet point interconnection arrangement" is an arrangement by which each telecommunications carrier builds and maintains its network to a meet point.

**Network element.** A "network element" is a facility or equipment used in the provision of a telecommunications service. Such term also includes, but is not limited to, features, functions, and capabilities that are provided by means of such facility or equipment, including but not limited to, subscriber numbers, databases, signaling systems, and information sufficient for billing and collection or used in the transmission, routing, or other provision of a telecommunications service.

**Number portability.** The term "number portability" means the ability of users of telecommunications services to retain, at the same location, existing telecommunications numbers without impairment of quality, reliability, or convenience when switching from one telecommunications carrier to another.

**Operator services.** "Operator services" are any automatic or live assistance to a consumer to arrange for billing or completion of a telephone call. Such services include, but are not limited to, busy line verification, emergency interrupt, and operator-assisted directory assistance services.

**Physical collocation.** "Physical collocation" is an offering by an incumbent LEC that enables a requesting telecommunications carrier to:

(1) place its own equipment to be used for interconnection or access to unbundled network elements within or upon an incumbent LEC's premises;

(2) use such equipment to interconnect with an incumbent LEC's network facilities for the transmission and routing of telephone exchange service, exchange access service, or both, or to gain access to an incumbent LEC's unbundled network elements for the provision of a telecommunications service;

(3) enter those premises, subject to reasonable terms and conditions, to install, maintain, and repair equipment necessary for interconnection or access to unbundled elements; and

(4) obtain reasonable amounts of space in an incumbent LEC's premises, as provided in this part, for the equipment necessary for interconnection or access to unbundled elements, allocated on a first-come, first-served basis.

**Pre-ordering and ordering.** "Pre-ordering and ordering" includes the exchange of information between telecommunications carriers about current or proposed customer products and services or unbundled network elements or some combination thereof.

**Provisioning.** "Provisioning" involves the exchange of information between telecommunications carriers where one executes a request for a set of products and services or unbundled network elements or combination thereof from the other with attendant acknowledgments and status reports.

**Rural telephone company.** A "rural telephone company" is a LEC operating entity to the extent that such entity:

(1) provides common carrier service to any local exchange carrier study area that does not include either:

(i) any incorporated place of 10,000 inhabitants or more, or any part thereof, based on the most recently available population statistics of the Bureau of the Census; or

(ii) any territory, incorporated or unincorporated, included in an urbanized area, as defined by the Bureau of the Census as of August 10, 1993;

(2) provides telephone exchange service, including exchange access, to fewer than 50,000 access lines;

(3) provides telephone exchange service to any local exchange carrier study area with fewer than 100,000 access lines; or

(4) has less than 15 percent of its access lines in communities of more than 50,000 on February 8, 1996.

**Service control point.** A "service control point" is a computer database in the public switched network which contains information and call processing instructions needed to process and complete a telephone call.

**Service creation environment.** A "service creation environment" is a computer containing generic call processing software that can be programmed to create new advanced intelligent network call processing services.

**Signal transfer point.** A "signal transfer point" is a packet switch that acts as a routing hub for a signaling network and transfers messages between various points in and among signaling networks.

**State commission.** A "state commission" means the commission, board, or official (by whatever name designated) which under the laws of any State has regulatory jurisdiction with respect to intrastate operations of carriers. As referenced in this part, this term may include the Commission if it assumes the responsibility of the state commission, pursuant to section 252(e)(5) of the Act. This term shall also include any person or persons to whom the state commission has delegated its authority under section 251 and 252 of the Act.

**State proceeding.** A "state proceeding" is any administrative proceeding in which a state commission may approve or prescribe rates, terms, and conditions including, but not limited to, compulsory arbitration pursuant to section 252(b) of the Act, review of a Bell operating company statement of generally available terms pursuant section 252(f) of the Act, and a proceeding to determine whether to approve or reject an agreement adopted by arbitration pursuant to section 252(e) of the Act.

**Technically feasible.** Interconnection, access to unbundled network elements, collocation, and other methods of achieving interconnection or access to unbundled network elements at a point in the network shall be deemed technically feasible absent technical or operational concerns that prevent the fulfillment of a request by a telecommunications carrier for such interconnection, access, or methods. A determination of technical feasibility does not include consideration of economic, accounting, billing, space, or site concerns, except that space and site concerns may be considered in circumstances where there is no possibility of expanding the space available. The fact that an incumbent LEC must modify its facilities or equipment to

respond to such request does not determine whether satisfying such request is technically feasible. An incumbent LEC that claims that it cannot satisfy such request because of adverse network reliability impacts must prove to the state commission by clear and convincing evidence that such interconnection, access, or methods would result in specific and significant adverse network reliability impacts.

**Telecommunications**. The term "telecommunications" means the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received.

**Telecommunications carrier.** A "telecommunications carrier" is any provider of telecommunications services, except that such term does not include aggregators of telecommunications services (as defined in section 226 of the Act). A telecommunications carrier shall be treated as a common carrier under the Act only to the extent that it is engaged in providing telecommunications services, except that the Commission shall determine whether the provision of fixed and mobile satellite service shall be treated as common carriage. This definition includes CMRS providers, interexchange carriers (IXCs) and, to the extent they are acting as telecommunications carriers, companies that provide both telecommunications and information services. Private Mobile Radio Service providers are telecommunications carriers to the extent they provide domestic or international telecommunications for a fee directly to the public.

**Telecommunications equipment.** The term "telecommunications equipment" means equipment, other than customer premises equipment, used by a carrier to provide telecommunications services, and includes software integral to such equipment (including upgrades).

**Telecommunications service.** The term "telecommunications service" means the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public, regardless of the facilities used.

**Telephone exchange service**. The term "telephone exchange service" means (A) service within a telephone exchange, or within a connected system of telephone exchanges within the same exchange area operated to furnish to subscribers intercommunicating service of the character ordinarily furnished

by a single exchange, and which is covered by the exchange service charge, or (B) comparable service provided through a system of switches, transmission equipment, or other facilities (or combination thereof) by which a subscriber can originate and terminate a telecommunications service.

**Telephone toll service.** The term "telephone toll service" means telephone service between stations in different exchange areas for which there is made a separate charge not included in contracts with subscribers for exchange service.

**Virtual collocation.** "Virtual collocation" is an offering by an incumbent LEC that enables a requesting telecommunications carrier to:

(1) designate or specify equipment to be used for interconnection or access to unbundled network elements to be located within or upon an incumbent LEC's premises, and dedicated to such telecommunications carrier's use;

(2) use such equipment to interconnect with an incumbent LEC's network facilities for the transmission and routing of telephone exchange service, exchange access service, or both, or for access to an incumbent LEC's unbundled network elements for the provision of a telecommunications service; and

(3) electronically monitor and control its communications channels terminating in such equipment.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF ALBERT E. WOOD, JR.**

**DOCKET NO. 960847-TP**

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

A. My name is Albert E. Wood, Jr. My business address is 545 E. John Carpenter Freeway, Irving, TX, 75062.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations as a Staff Administrator in the Service Activation Section of the Service Fulfillment Department.

**Q. PLEASE BRIEFLY STATE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.**

A. I received a B.B.A degree from the University of Texas at El Paso. I have completed numerous technical and business related courses provided through GTE's Education and Training Department.

I began my career with GTE in 1980 as a Central Office and Toll Network Supervisor. In 1984 I joined the Service Fulfillment Department working on the implementation of a mechanized telephone service provisioning and activation system. In 1989 I

became responsible for E9-1-1 systems implementation, data base generation and update processing for GTE's 13 Central Area states. I served as team leader of the Operation's Systems migration team in the Central Area for the GTE /Contel merger. In 1995 I assumed my current position in the Service Activation section at GTE Telephone Operations Headquarters.

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

A. My testimony presents GTE's position on the open issues between it and AT&T with regard to AT&T's requests for unbundled elements and wholesale services. I address only loop and switch unbundling (other parts of the network--such as Signaling System 7 and Advanced Intelligent Network--are discussed by other witnesses). I will explain how these network elements are interrelated, and how a request for one network element might affect other network elements, including operator services and directory assistance. I will state the relevant provisions of the Telecommunications Act of 1996 (the "Act") and the FCC's rules that govern the unbundling of the loop and switch. I will next summarize the issues to be arbitrated and the party's position with respect to loop and switch unbundling and operator service and directory assistance issues. Finally, I will explain the rationale underlying GTE's position.

Accompanying this testimony (and labelled as Exhibit No. AEW-1) is a videotape that provides a tour of one type of GTE central office. The central office depicted in the video is just one type of central office that is included in GTE's network. GTE's network includes many different types of central offices, loops and switches that each have different capabilities and functions. For example, some central offices may use "remote switching units" or other remote units that may affect how calls are carried, how central offices function, and whether certain network elements may be unbundled. In sum, there is no "one size fits all" assumption one may rely upon in determining whether a particular part of GTE's network can be unbundled. This video includes a computer graphic diagram of the loop and switch, and this diagram is reproduced as Exhibit No. AEW-2.

**Q. PLEASE DESCRIBE THE LOOP.**

A. As depicted in the video and on the attached diagram, the local loop begins at the network interface device ("NID"), which is the point of demarcation between the customer's inside wiring and GTE's facilities. A customer's telephone line typically extends from the NID to a pedestal, where it is aggregated with a handful of other nearby subscriber lines into a single cable sheath. In many of GTE's local networks, the cable containing these aggregated lines extends from the pedestal to a distribution box (the distribution box is often referred to as a "cross-connect"),

where the cable is aggregated with other cables into a higher capacity cable, or "feeder" cable (as discussed in this testimony, application of pair-gain technology is an alternative to the use of feeder cables). The feeder cable extends to the central office, where it is connected to the main distribution frame ("MDF"). The lines and cables extending from the NID to the MDF are referred to collectively as the local loop.

Many of GTE's local networks have different types of distribution and feeder facilities that use different technologies and have different capabilities. This point is especially important, because AT&T erroneously assumes that all of GTE's loop facilities are alike, and that a "one size fits all" approach to loop unbundling is possible. AT&T's erroneous assumption will be discussed in later sections of this testimony.

**Q. PLEASE DESCRIBE THE SWITCH.**

A. The switching part of the network begins where the local loop ends. In many of GTE's local networks, the local loop (or "subscriber line") is extended from the MDF by way of cabling facilities to a port. This port provides the subscriber line with access to the tables and call processors that are part of the integrated switching fabric. The switch itself is a computer that provides call-related capabilities and functions such as dial tone, basic switching, custom calling features (e.g., call waiting and

three-way calling), and call signaling generation. It also provides access to transport facilities, operator systems, databases and Signaling System 7 ("SS7") capability, and some switches even are capable of providing access to GTE's Advanced Intelligent Network ("AIN").

In order to understand the issues presented by AT&T's request for switch unbundling and why this request is not technically feasible, one must understand how a switch operates. Imagine that you are in Tampa and you want to call a friend in New York City. You pick up the phone and dial the long distance number. The digits you dialed travel over the local loop to the MDF, where they are "cabled over" to the line card where your port resides. The port provides these digits with access to the switching fabric. Embedded in this fabric are tables that "read" the digits you have dialed and that route your call to the appropriate trunk group. In our example, you are making a long-distance call to New York City; therefore, you dialed the numbers "1-212-NXX-XXXX." The table reads these numbers, recognizes that you are placing a long-distance call, and the switch's call processors route your call to the dedicated trunk group serving your presubscribed long-distance carrier.

If you were making a local call to someone served by the same central office, then your call would be routed to the appropriate

port of the called party. Similarly, if you called Directory Assistance ("DA") by dialing "411" or Operator Services ("OS") by dialing "0," the tables and call processors would route your call to the DA or OS trunk group.

The "table reading functions" and the "call processor routing functions" described above are accomplished by the assignment of a Line Class Code ("LCC") to every subscriber telephone number. LCCs are table values that define, among other things, the class of service provided to a specific subscriber, the rate center for a given subscriber line, and dialed number analysis/routing information associated with that line. A LCC must be assigned to a specific subscriber line in order for the calls placed over that line to be read and routed to the appropriate trunk group.

AT&T proposes that GTE assign LCCs to each of AT&T's customers, or that GTE provision all of its switches in some other manner to accommodate the trunk groups requested by AT&T. GTE's rationale later in the testimony explains why AT&T's proposal is not feasible. The testimony also explains why AT&T's proposals with regard to Busy Line Verify and Busy Line Interrupt will require AT&T to pay the significant costs of implementing such proposals.

**Q. WHAT ARE THE ILEC'S UNBUNDLING REQUIREMENTS UNDER THE TELECOMMUNICATIONS ACT OF 1996 AND THE FCC'S ORDER?**

A. Section 251(c)(3) of the Act requires incumbent local exchange carriers ("ILECs") to provide to any requesting telecommunications carrier "nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory." 47 U.S.C. § 251(c)(3) (1996). The Act defines network element to mean

> a facility or equipment used in the provision of a telecommunications service. Such term also includes features, functions, and capabilities that are provided by means of such facility or equipment, including subscriber numbers, databases, signaling systems, and information sufficient for billing and collection or used in the transmission, routing, or other provision of a telecommunications service.

(Act at § 153(29).)

In its recent Order, the FCC identified seven network elements that ILECs must offer on an unbundled basis, including the NIDs, the local loop, local and tandem switching capability, and OS and DA facilities (as discussed in this testimony, the type of access to

OS and DA facilities, functions and capabilities requested by AT&T requires further unbundling of GTE's switches; therefore, our discussion of the feasibility of access to OS and DA is included in this testimony). (Implementation of Local Competition Provisions in the Telecommunications Act of 1996, CC Docket 96-98, FCC 96-325 (released Aug. 8, 1996) ("Order") at ¶ 366.) The FCC did not require sub-loop unbundling, but noted that State commissions are free to prescribe additional unbundled elements and that parties may agree to the unbundling of additional elements through voluntary negotiation. Id.

The FCC found that it was technically feasible for ILECs to unbundle the NID, the loop and the switch, for it adopted a very broad definition of technical feasibility:

> [w]e conclude that the term "technically feasible" refers solely to technical or operational concerns, rather than economic, space, or site considerations.

(Order at ¶198.) The FCC concluded that all State commissions must apply this definition of technically feasible. (Order at ¶ 281.) (The FCC has placed the burden of proof regarding technical feasibility on ILECs by requiring ILECs to show that it is technically infeasible to unbundle a given element. (Order at ¶ 194.) However, GTE makes this showing regarding certain elements requested by AT&T below.)

As discussed in the Arbitration Brief included in GTE's Response, GTE disagrees with the FCC's definition of technical feasibility. Indeed, under the FCC's definition almost anything is "feasible," because the question of feasibility is decided in a vacuum without reference to real-world concerns such as cost, space, or existing network configurations. As a threshold matter, GTE requests that the Commission reject the FCC's definition and permit the parties to introduce evidence of technical feasibility based on a more reasonable definition of this term. Having preserved this argument, GTE will address in this testimony AT&T's request for unbundled NIDs, loops and switches using the FCC's definition of technical feasibility.

**Q. WHAT ARE THE PRICING STANDARDS UNDER THE TELECOMMUNICATIONS ACT OF 1996 AND THE FCC'S ORDER?**

A. Under section 252(d) of the Act, State commissions are given the authority to establish prices for unbundled network elements--including the NID, the loop, and the switch--pursuant to the following pricing standards:

> (1) INTERCONNECTION AND NETWORK ELEMENT CHARGES. -- Determinations by a State commission of the . . . just and reasonable rate for the network elements for purposes of [section 251(c)(3)] --

(A) shall be (i) based on the cost (determined without reference to a rate-of-return or other rate-based proceeding) of providing the interconnection or network element (whichever is applicable), and(ii) nondiscriminatory, and

(B) may include a reasonable profit.

(Act at § 252(d)(1)(A)-(B).)

Despite the Act's plain language granting the States the authority to set prices for unbundled elements, the FCC adopted rules requiring unbundled network elements to be priced at Total Element Long Run Incremental Cost ("TELRIC") plus a reasonable share of joint and common costs. GTE disagrees with the FCC's authority to make such a decision. The pricing methodology as defined and applied by the FCC, and GTE's position on this issue is set forth in the Direct Testimony and asssociatd Report of David S. Sibley.

**Q. WHAT ARE THE APPROPRIATE STANDARDS FOR COST RECOVERY?**

A. In addition to the question of appropriate pricing for unbundled elements, the Commission must identify the appropriate cost recovery mechanisms where GTE is required to modify its network to accommodate AT&T's requests for interconnection and unbundling.

Many of AT&T's requests, including its requests for loop and switch unbundling, require significant modifications to GTE's existing networks, and in many instances require new technologies to be developed and deployed. The question, of course, is who should bear the cost of these modifications and technologies.

In its rules, the FCC rejected the ILECs' position that requesting carriers "take the ILEC networks as they find them," and requires ILECs to take "affirmative steps" to modify their existing facilities to meet the requirements of requesting carriers. (See, e.g. Order at ¶ 382.) GTE disagrees with the FCC's decision to require ILECs to take affirmative steps to modify their networks. But assuming, arguendo, the FCC's decision is lawful, the FCC itself recognizes that the requesting carrier must bear the cost of compensating the ILEC for modifications (See, e.g., Order at ¶ 225 ("as long as new entrants compensate incumbent LECs for the economic cost of the higher quality interconnection, competition will be promoted"); ¶ 382 (the requesting carrier must bear the cost of compensating the ILEC for loop conditioning); ¶ 393 ("the new entrant bears the cost connecting its NID to the incumbent LEC's NID"); ¶ 751 (ILECs may recover costs of collocation cages)). Simply put, if an alternative local exchange carrier ("ALEC") demands changes to an ILEC's

network, it must pay for them.

AT&T, however, does not agree with this principle; instead, AT&T would have GTE and its customers pay for modifications to facilitate interconnection with AT&T's network. But the FCC's rules are quite clear on this point:

> [w]e conclude that the term "technically feasible" refers solely to technical or operational concerns, rather than economic, space, or site considerations. We further conclude that the obligations imposed by sections 251(c)(2) and 251(c)(3) include modifications to incumbent LEC facilities to the extent necessary to accommodate interconnection or access to network elements.
>
> * * *
>
> We find that the 1996 Act bars consideration of costs in determining "technically feasible" points of interconnection or access [to unbundled elements]... Of course, a requesting carrier that wishes a "technically feasible" but expensive interconnection would, pursuant to section 252(d)(1), be required to bear the cost of that

interconnection, including a reasonable profit.

(Order at ¶ 198 and 199 (emphasis added)).

Similarly, in explaining that site restrictions do not represent a "technical" obstacle for purposes of interconnection or unbundling where it is possible for a site to be expanded, the FCC expressly recognized that "the requesting party would bear the cost of the necessary expansion." (Order at ¶ 201 (emphasis added).)

In sum, AT&T must bear the costs associated with all of its modifications. Indeed, to impose these costs on the ILEC would result in an unconstitutional taking of ILEC property without just compensation. This issue is discussed in greater detail in the Takings Report included in GTE's Response.

Finally, although the FCC adopted an overly broad definition of technical feasibility, it recognized that a request for interconnection or unbundled elements that pose threats to network reliability and security are "necessarily contrary" to a finding of technical feasibility:

> [w]e...conclude, however, that legitimate threats to network reliability and security must be considered in evaluating the technical feasibility of interconnection or access to incumbent LEC networks. Negative network

> reliability effects are necessarily contrary to a finding of technical feasibility. Each carrier must be able to retain responsibility for the management, control, and performance of its own network.

(Order at ¶ 203.)

As discussed below, assuming the Commission adopts the FCC's definition of technical feasibility, and assuming this definition withstands judicial scrutiny, GTE agrees to perform the necessary modifications requested by AT&T pending appeal, provided that such modifications will not interfere with GTE's current or future network configurations, and provided further that GTE will recover all the costs of such modifications from AT&T.

**Q. PLEASE DISCUSS THE POSITIONS OF THE PARTIES RELATIVE TO THE LOOP.**

A. AT&T has proposed that the local loop be divided into four elements that can be offered separately or in combination: (1) the NID; (2) Loop Distribution; (3) Loop Feeder; and (4) the Loop Concentrator/Multiplexer.

The FCC does not require ILECs to permit a new entrant to connect its loops directly to the ILEC's NID. (Order at ¶ 394.) Instead, the FCC requires requesting carriers to connect their own

NID to the ILEC's NID. GTE, however, will do more than what the FCC requires: GTE will allow AT&T to connect its loops directly to GTE's NID, provided that such interconnection does not adversely affect GTE's network.

GTE also agrees to unbundle the loop from the switch; provided, however, that AT&T (1) notify GTE when it intends to deploy any service-enhancing copper cable technology (e.g., HDSL, ISDN) and, if so, certify that such technology will not interfere with GTE's existing or future technology within a given cable sheath or other GTE facility; and (2) pays all the costs associated with unbundling the loop from the switch, including the costs of testing AT&T's technology and the costs of any loop conditioning.

Finally, GTE agrees to provide as separate elements the loop distribution, loop feeder, and loop concentrator/multiplexer on an individual case-by-case basis, subject to the above conditions regarding total loop unbundling.

**Q. PLEASE DISCUSS THE POSITIONS OF THE PARTIES RELATIVE TO THE SWITCH.**

A. AT&T requests that GTE unbundle its switch so that AT&T can route its customers to AT&T's OS and DA platforms, and dedicated trunk groups linked to any interexchange carriers of

AT&T's designation. AT&T apparently believes that such unbundling is technically feasible because GTE's switches already provide this capability, and all AT&T seeks to do is provide GTE with a service order.

AT&T's request is predicated upon an erroneous assumption. AT&T seeks the ability to do much more than just provide GTE with a service order; indeed, AT&T wants GTE to establish separate trunk groups so that AT&T can route its customers' calls to AT&T-owned and operated OS and DA centers (or those designated by AT&T). This request is not technically feasible, because it ignores the limited switch capacity available to meet AT&T's demands. Moreover, AT&T ignores the fact that substantial costs will be incurred to provide existing switches with the capability of performing the routing requested by AT&T. Finally, unbundling the switch as AT&T requests will permit AT&T to avoid access charges, because GTE will have no way of knowing whether a call routed by AT&T is a local call, an intraLATA call, or a long-distance call. The Act and the FCC's rules require AT&T to continue paying certain access charges for a limited time, but AT&T's proposal will enable it to do indirectly that which it cannot do directly.

AT&T also requests that the GTE network allow AT&T operators to perform Busy Line Verification and Busy Line Interrupt

functions. Although this request is technically feasible, allowing AT&T operators to perform these functions will require GTE to add equipment to its end office switches and direct trunk groups in order to record and bill this service. Accordingly, AT&T must pay GTE's costs of adding this equipment, as well as the recurring cost of providing the service.

Given the problems presented by AT&T's request, GTE will agree to switch unbundling only where (1) AT&T agrees to pay all the costs associated with near-term unbundling, and its share of the costs of long-term unbundling solutions, including the costs of adding new capacity, conditioning existing switches and necessary enhancements and modifications to ordering, provisioning and billing systems; and (2) AT&T establishes a method to ensure that it pays all the access charges required by law.

**Q. WHAT IS GTE'S POSITION ON THE NID?**

A. GTE will allow AT&T to connect its loops directly to GTE's NID, provided that (1) such interconnection does not adversely affect the reliability and security of GTE's network, (2) GTE recovers all costs associated with unbundling its NID, and (3) GTE receives "just and reasonable" compensation from AT&T for the unbundled NID.

**Q. WHAT IS GTE's POSITION ON LOOP AND SUB-LOOP UNBUNDLING?**

A. GTE's loop plant consists of several different types of facilities used to connect customers to their central office. This plant is typically designed in one of two ways: (1) a feeder/distribution design; or (2) a main cable-fed design.

Under a feeder/distribution design, the local loop begins at the NID and extends to a pedestal, where it is aggregated with a handful of other nearby subscriber lines into a single cable sheath. The cable containing these aggregated lines extends from the pedestal to a distribution box, where it is aggregated with other cables into a single higher capacity cable, or "feeder" cable. The feeder cable extends to the central office, where it is connected to the MDF.

In a main cable-fed design, the feeder cable begins at the MDF of the central office and terminates at the NID located on the customer's premises. With this type of design, there may not be a distinct physical point where a feeder loop section ends and a distribution section begins. A cable-fed design is typically used when service is being provided to a large business or an office building where many individual subscribers can be served on the customer side of the NID.

Because GTE's network includes both types of designs, any request for sub-loop unbundling must be examined on a case-by-case basis. In addition, there are special loop designs within any given feeder/distribution design or main cable-fed design that must be considered in determining whether and how sub-loop unbundling may be achieved. For example, feeder plant can be provisioned using "pair gain" electronics. If the pair gain uses a central office terminal configuration (a double-ended pair gain), there exists a physical point of interface with the MDF at the serving wire center. But if the pair gain device uses a direct connect configuration (a single-ended pair gain) (the FCC's Order refers to this type of device as an integrated digital loop carrier ("IDLC")), then the wire center connection is made directly into the switch by way of a DS-1 interface. In this latter case, there is no connection or access to the MDF; therefore, additional equipment such as channel banks must be installed in order to unbundle the loop.

This point is illustrated in the following example. Assume that AT&T requests unbundled loops from a central office where loops are provisioned by an IDLC, which is a type of single-ended pair gain device as shown on Exhibit No. AEW-3.

As you can see on the Exhibit, many individual telephone lines (subscriber lines) are aggregated at a remote unit, such as an

Integrated Digital Loop Concentrator ("IDLC"), which is connected to the central office by a single, high-capacity transmission facility. (The central office is the host to the remote unit.) Although only one IDLC is depicted here, there may be several IDLCs serving one central office. In this way, more efficient use is made of the network -- instead of having each individual subscriber line extended to the central office, the lines are aggregated at the IDLC, where messages can be carried over one facility to the central office. The use of IDLCs is a common practice in the telecommunications industry, and reflects well-settled principles of network engineering.

GTE's network -- including the deployment of IDLCs -- was engineered on the assumption that a single, integrated company would provide local telephone service to every subscriber. The use of IDLCs thus enables GTE and other ILECs to achieve economies of scale. Now, however, much of GTE network must be "reengineered" to accommodate AT&T's requests for unbundled loops. In order to unbundle local loops at central offices that use IDLCs, it is necessary to add channel banks at both the IDLC site and at the central office (this process does not apply to next generation DLC ("NGDLC") technology).

The cost of this reengineering will be significant. In Florida, GTE's network consists of over 2 million access lines -- all of

which are served by numerous central office switches and many if not most of which are also served by a variety of ILDCs and similar remote switching units, or pair gain devices. AT&T's request for unbundled loops indicates that AT&T wants the ability to obtain unbundled loops at all GTE central offices and wants these loops provisioned immediately. To do so, GTE would have to add either central office line cards or channels banks to those lines served by IDLCs, at a cost that could amount to many millions of dollars.

Of course, if AT&T needs all the local loops in a given central office unbundled, there may be more cost-effective methods of provisioning the unbundled loops. But in order for the parties to determine the best method, AT&T must notify GTE of the specific central offices or specific loops it wants unbundled, and the parties must discuss the feasibility of AT&T's requests on a case-by-case basis. AT&T's "one size fits all" approach simply does not work where different types of loop distribution and feeder facilities are deployed throughout the network. And this is especially true when one considers that there exist no formal industry standards applicable to the cross-connection of ILEC and third-party feeder and distribution facilities. For example, standards for voltage, impedance, cross-talk, and other transmission characteristics have not yet been established for sub-loop elements, and the lack of such standards is one of the

reasons that loop and sub-loop interconnection must be reviewed for technical compatibility on a case-by-case basis.

Also, when considering sub-loop unbundling for feeder/distribution design plant, the integrity of the network would be put at significant risk if AT&T and other carriers were given unrestricted access to GTE's cross-connect locations in order to connect and disconnect their facilities. For example, the network could be physically damaged at the cross-connect locations due to the intentional or inadvertent acts by non-GTE personnel. Furthermore, if appropriate security precautions are not taken, a third party could establish connections for eavesdropping, wiretap and toll fraud purposes. GTE's outside plant personnel are constantly on the lookout for unauthorized connections to the Company's facilities. Today, all connections to GTE's outside plant facilities belong to and are controlled by GTE, making such security checks possible. But if multiple carriers are given access to these facilities, it would be difficult to determine who is responsible for unauthorized connections.

Given these security concerns, GTE does not believe that sub-loop unbundling is technically feasible. This conclusion is supported by the FCC's rules, which provide that:

> legitimate threats to network reliability and security must be considered in evaluating the

> technical feasibility of interconnection or access to incumbent LEC networks. Negative network reliability effects are necessarily contrary to a finding of technical feasibility. Each carrier must be able to retain responsibility for the management, control, and performance of its own network.

(Order at ¶ 203 (emphases added).)

At the very least, if sub-loop unbundling is ordered then AT&T must be required to adhere to reasonable security and reporting procedures that will minimize threats to network reliability and security (assuming such procedures could be developed), and AT&T must bear responsibility for network problems and security breaches caused by AT&T's negligence. Furthermore, it is essential that all work performed by non-GTE personnel at these facilities be promptly and accurately reported to GTE. In this way, GTE's facility assignment records can be updated to ensure that facility records are accurate and can be relied upon for maintaining existing subscriber lines or adding new ones.

AT&T also demands that the installation, maintenance and repair intervals applicable to GTE's "bundled" loops must also be made available to AT&T's unbundled loops that are contained in the same class of loops located in the same geographic area. Here,

too, AT&T's request ignores the effect of loop unbundling upon installation, maintenance and repair of subscriber lines. In the GTE network, approximately 20% of customers are connected to central offices served by IDLCs. But with loop unbundling and the introduction of multiple providers, the overlay point-to-point transport capacity (such as the D4 banks) will be exhausted sooner than planned. Therefore, customers will experience service delays unless additional capacity is added to accommodate AT&T's requests. If additional capacity is required, then AT&T and the other requesting carriers must pay for the costs associated with this additional capacity.

**Q. WHAT IS GTE'S POSITION ON SWITCH UNBUNDLING?**

A AT&T requests that GTE unbundle its switch so that AT&T can route its customers to AT&T's OS and DA platforms, and dedicated trunk groups linked to any interexchange carrier of AT&T's designation. AT&T apparently represents that such unbundling is technically feasible because GTE's switches already provide this capability, except that GTE will receive a service order from the new carrier's service center as opposed to its own GTE service centers.

AT&T misinterprets the nature of the service provisioning and activation process. In order for calls to be routed to specific trunk groups as AT&T requests, appropriate Line Class Codes must be

identified and activated (AT&T states that it may need between 32-320 LCCs per switch, but it does not set forth a method for identifying the required LCC value for each AT&T customer). More specifically, AT&T wants to offer its end-users the ability to have their OS, DA, and long-distance calls routed to separate providers. To offer this functionality, a unique LCC value must be determined for every permutation of the required options, and the LCCs must then be placed on each customer's switch entry. GTE would be required to perform a manual search to find the required LCC values. The time and labor needed to accomplish this task would depend on (1) the number of routing possibilities AT&T requests for a given switch, and (2) the number of different routing options AT&T makes available to its customers.

AT&T also ignores the fact that substantial costs will be incurred to provide existing switches with the capability of performing the routing requested by AT&T. It is difficult to estimate the costs of increasing switch capacity because these costs will vary depending on the particular switch in question. However, GTE believes these costs could run to many tens of millions of dollars in order to meet AT&T's demands for separate OS and DA trunks alone. The interexchange trunk routing requested by AT&T would increase these costs even further.

AT&T's request also could exhaust the capacity of the switch and

adversely affect network capabilities. As more LCCs and more routing options are added, the switch must perform more "look ups" and thereby perform more work than before. As a result, the switch will begin to operate at lower speeds with its ever-increasing workload resulting in call completion performance problems. Moreover, if switch capacity is exceeded, someone would be required to write the computer software programs necessary to increase capacity. Here again, AT&T does not explain who will perform and pay for these capacity upgrades.

In addition to the concerns discussed above, the attached letter from Lucent Technologies (Exhibit No. AEW-4) -- the manufacturer of the 5-ESS switch referenced in AT&T's testimony -- sets forth a number of issues that must be addressed in implementing the "LCC solution" advocated by AT&T. The issues identified by Lucent include (1) the need for every existing switch to be preconditioned, (2) the need to evaluate the potential "memory exhaust impact" upon the switch, (3) the class of service limitations that could result, and (4) the unavailability of local 555 service. In its letter, Lucent acknowledges that a long-term solution to the LCC problem is needed, and notes that once a solution is available, "[any] recent change effort should be reversed to restore memory resources," and that "effort will be required to move all alternate provider lines into original line classes, remove all screening, and other database work" (See

Lucent Letter at 4 - Exhibit AEW-4). Such a long-term solution will very likely involve the development of industry standards from which equipment manufacturers, such as Lucent Technologies, can design and build products. Such standards do not exist today. In other words, AT&T's proposal for switch unbundling requires GTE first to alter its existing switches to accommodate AT&T, and then to "undo" what GTE has done when a permanent solution is found. And, of course, GTE must pay for all this under AT&T's position.

Not only does AT&T's proposal for routing to AT&T's DA and OS platforms pressent serious and costly operational problems, its request for unbundling of GTE's DA database would also present technical difficulteis that would, at the very least, require AT&T to cover GTE's costs of implementation. GTE's DA database is designed for access by only one service provider. To allow for access by multiple service providers, GTE would be required to establish a gateway and firewalls to ensure protection of proprietary information. In addition, the database would have to be modified to add access ports. Thus, implementation of access to GTE's DA database is dependent on vendor delivery of modifications and adequate cost recovery.

Additionally, because there are distinct and specific technical

interface requirements between operator position equipment and GTE's DA database, AT&T would be required to ensure that its equipment can interface with GTE's DA database, and compensate GTE for any modifications GTE might make in order to ensure compatibility.

AT&T has asked to establish Busy Line Verify (BLV) and Emergency Interrupt, also referred to as Busy Line Interrupt (BLI) as a required capability of AT&T operators. AT&T apparently believes that it should be able to deploy segregated one-way trunk groups from its operator services positions to GTE's end offices to perform these functions without having to call the GTE operator on an 'inward' basis. BLV and BLI interoperability between LECs utilize common verify and interrupt trunk groups. BLV and BLI charges are recorded and billing records initiated at the operator services switch. However, AT&T's request would require recording and billing at the end office. GTE would have to provision direct trunk groups with the capability of recording and billing in order to allow AT&T's operators to perform BLV and BLI functions. GTE would, of course, expect AT&T to pay for the cost of implementing this functionality at the end office switch.

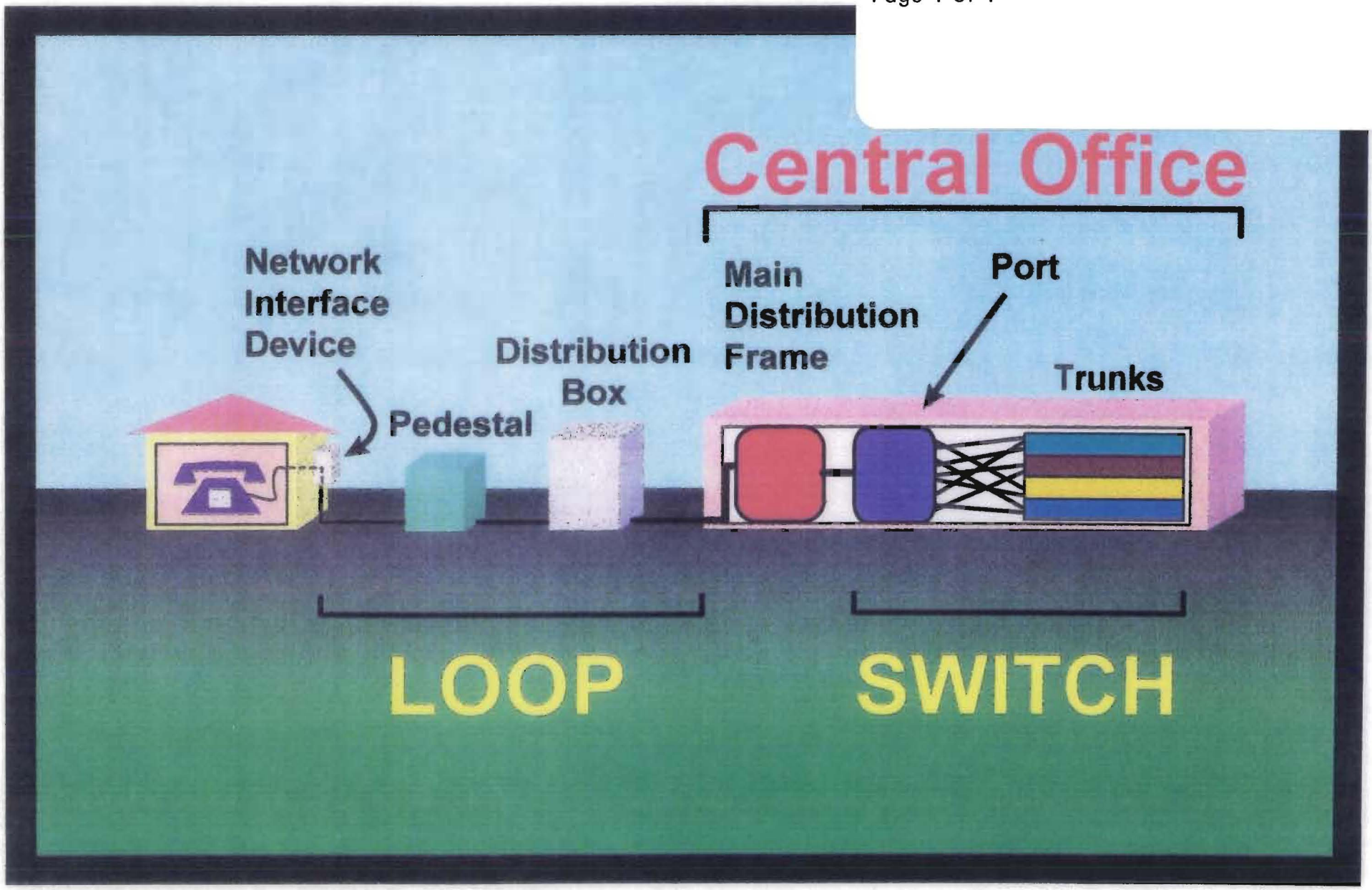
**Q. WILL YOU PLEASE SUMMARIZE YOUR TESTIMONY?**

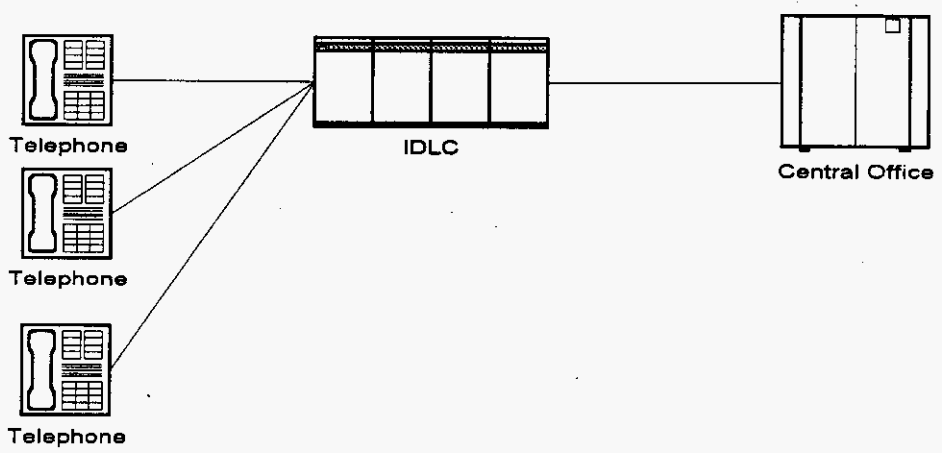
A. For all the reasons I discussed above, GTE will agree to switch unbundling only where (1) AT&T agrees to pay all the costs

associated with near-term, interim unbundling, and its share of the costs of long-term unbundling solutions, including the costs of adding new capacity or conditioning existing switches; (2) all users pay for the long-term industry standard solution; and (3) AT&T establishes a method to ensure that it pays all the access charges required by law.

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

A. Yes, it does.


Central Office
Network Interface Device
Pedestal
Distribution Box
Main Distribution Frame
Port
Trunks
LOOP
SWITCH


Telephone
Telephone
Telephone
IDLC
Central Office

Docket No. 960847-TP
Direct Testimony of Albert E. Wood, Jr.
Exhibit No. AEW-4
FPSC Exhibit No. _____

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June 25. 1996

**Subject: Dialing Parity of Directory Assistance and Operator Services for Competitive Resellers of Local Service**

Several companies filing comments with the Federal Communication Commission in response to the Notice of Proposed Rulemaking CC 96-98 on the *Implementation of the Local Competition Provisions of the Telecommunications Act of 1996* have stated that the FCC's rules should provide dialing parity for directory assistance and operator services. This would allow resellers of local service to provide their own operator systems or to buy operator services from a third-party provider. Any customer seeking operator/directory assistance would then dial the same digits ("0," "411," etc.) and would automatically be routed to the alternate service provider's operator services.

Implementation of this form of dialing parity may impact memory capacity of the 5ESS®-2000 Switch[1] and system resources on the 1A ESS™ Switch.[2] Call routes for directory assistance and operator services are derived from routing tables that use the Line Class Code and Class of Service to complete the call. These routing tables were designed for a single provider network, but with some modification provides the ability to handle a multiple local service provider environment.

Lucent Technologies has investigated conditional work-arounds to allow for distinct routes based on local service provider. The 5ESS-2000 Switch work-around is called Line Class Code -Rate Center Routing (LCC-RAC) and calls for replication of the existing routing tables for each reseller wanting distinct routes for directory assistance and operator services. On the 1A ESS Switch the work-around is called the Line Class Code-Class of Service approach and uses capabilities intended to allow for optional LEC routes based on Class of Service. The work-arounds have limitations and resource impacts. Information to assist in understanding and estimating these impacts are described in detail in the attachments.

Included with this document are three attachments:

- Attachment 1 - Detailed description of the 5ESS®-2000 Line Class Code-Rate Center Approach
- Attachment 2 - 5ESS®-2000 Switch Line Class Code-Rate Center Memory Model
- Attachment 3 - 1A ESS™ Switch Line Class Code-Class of Service Approach

**Note: This document is intended to be a statement of fact concerning currently proposed work-arounds. It is not an endorsement of any work-around by Lucent Technologies.**

This information should be immediately shared with your customers to provide the information needed to complete an analysis of the work-arounds in their networks. Your customers have heard, or can expect to hear, about these issues in state and federal proceedings as they negotiate interconnection agreements with competing local services providers. In

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[1] See Attachment 2 for 5ESS®-2000 Switch memory impacts.
[2] See Attachment 3 for 1A ESS™ Switch resource impacts.

addition to discussing the work-arounds with your customer, request requirements for a long-term solution to the issue of dialing parity for competitive resellers of local service.

P. J. Guarneri

Attachments

Copy To:

All NAR Customer Teams
ACBU Customer Team
M. E. Alexander
R. R. Allison
W. B. Bankhead
J. V. Bodycomb
R. L. Bower
T. C. Collins
K. B. Dalmia
D. R. Demian
J. Dunn
R. E. Heil
G. E. Hoffman
R. E. Hoffman
G. Huensch
L. D. Jenkins
R. L. Keck
J. Kruisbrink
F. M. Lax
H. M. Nicholson
G. R. Manley
R. B. Martin
L. M. Nye
D. Pfefferle
R. M. Presutti
R. A. Rockershousen
J. W. Russell
J. Sharpless
D. A. Ward
J. Walter
P. Wang

# 1. Local Exchange Services Resale

Local Exchange Service Resale (LEC Resale) is a concept where an existing customer's line can change to an alternate local service provider without moving physical equipment (e.g. tip/ring). The alternate provider "leases" the service from the LEC. While the telephone customer has chosen a different local provider the customer is still served off the same LEC switch.

With LEC Resale there is a need for certain aspects of call routing to be branded for the alternate provider. An alternate provider may desire specific call identification (e.g. announcements) and service treatments for their customers. Examples of this exist in the interLATA market place where specific identification tones and announcements are provided on operator calls (e.g. 0+interLATA).

In the LEC Resale market, it is desirable for an alternate provider to brand local operator (0- and 0+ local) services and other special services such as directory assistance and repair services. In the case of local operator service, an alternate provider may wish to direct these call to their own operator platform for branding and service control. Similarly, an alternate provider may desire to handle directory assistance or repair services with their own resources.

There is a need for long-term solution for switching equipment vendors to provide robust and efficient techniques for alternate providers. In the interim, there exists a limited workaround with shortcomings that may be attempted. The workaround known as Line Class Code-Rate Center (LCC-RAC) is discussed in subsequent sections.

# 2. 5ESS LCC-RAC Workaround

The 5ESS LCC-Rate Center(RAC) workaround uses routing techniques to alter the destination of an alternate provider's 0-, 0+ local, and special services calls. (e.g. 411/611). It requires replicating and customizing selected office Line Class Codes-Rate Centers (v4.1), Digit Analysis Selectors (DAS-v9.1), Screening Codes, and screening (Rate and Route - v10.10).

Screening is the core element of this workaround which permits an alternate provider's 0-, 0+ local, and special services calls to be directed to an alternate provider's resources. The sharing of a switch owner's digit analysis tables and replication of other screening entries permit the regular dialing patterns to work.

## *2.1. Switch Pre-conditioning*

Below is a description of LCC-RAC database pre-conditioning.

- Identify the set of LCC-RACs where an alternate provider can consider providing service. For these LCC-RACs record the accessed Screen Codes, DASs, Primary Digit Interpreter Tables (PDIT) and Local Digit Interpreter Tables (LDIT).

- Assure that each accessed Primary Digit Interpreter Table (PDIT)'s 0- entry has a Code Destination Index (CDI) value that is not used by any other dial code.

- If any alternate provider is considering special services (e.g. 411/611) then assure that the LDIT's 411/611/... entries have CDIs that are not used by any other dial code. In addition, digit analysis must have expected call types for these codes (e.g. LOCDA for 411, REPAIR for 611).

- If any alternate provider is considering special services (e.g. 411/611), a unique code conversion will be necessary to avoid conflicts with switch owner code conversions. Since code conversion requires a DAS and Call Type (e.g. LOCDA), the accessed switch owner's DASs must be copied to an alternate provider's DAS and the association recorded. The code conversion can be built using the new alternate provider DASs and special service call types.

  Note that a code conversion to a ten digit number is mandatory for alternate provider's routing special service calls to FGD trunks.

- Build any new trunks to the alternate provider. For example, operator trunks may be desired by the alternate provider.

- Build route indices to access the alternate provider's operator resources.

- If any alternate provider is considering special services (e.g. 411/611) build route indices to access the alternate provides resources.

- For all accessed switch owner's Screen Codes, define and record associated alternate provider Screen Codes.

- Build the alternate provider LCC-RACs by replicating the switch owner's LCC-RAC and mapping DASs and Screen Codes to the alternate provider's values. Note that a DAS change is only necessary for alternate providers that will provide special services.

  Record the association between the switch owner's LCC-RAC and the alternate provider's LCC-RAC.

- Identify all CDIs used in the accessible PDITs and LDITs.

- The recorded association of switch owner screen codes to alternate provider screen codes requires rate and route entries (screening - v10.10) for the alternate provider. Build the equivalent screening entries for the alternate provider with the following modifications:

  1. For the alternate provider SCs and the 0- CDI(s), the appropriate screening entry will contain the alternate provider's operator route index.

  2. For the alternate provider SCs and all local CDIs with a 0+ operator prefix, the screening entry will contain an alternate provider operator route index.

  3. For the alternate provider SCs and the special services' CDIs, the appropriate screening entry will contain the alternate provider's special service route index(s).

  4. Within the switch owner's screening, there may be instances where operator and special services are being blocked. The switch owner and alternate provider should agree on whether or not blocking takes precedence over the above modifications.

### *2.2. Customer changing provider*

When a customer switches to/from an alternate local provider, the database provisioner will look at the LCC-RAC associations and select the LCC of the new provider. A line recent change (e.g. v1.6, v1.8. ...) to

update the Line Class Code to the new provider is executed. At this point the customer is operative from the new provider's environment.

## 3. 5ESS LCC-RAC Workaround Issues

Investigations have identified the following issues for this workaround.

1. Pre-conditioning Effort

   The switch owner will need to execute recent changes to pre-condition the switch for each alternate provider. The majority of this recent change effort is in replication of screening (v10.10) for every alternate provider.

   With the increased translation complexity , the switch owner will have additional long- term data administration issues. For example, modifications to screening data must be done for each alternate provider.

2. Memory Impact

   The 5ESS database memory is impacted by the translation additions. The most impacted area is the 5ESS redundant Switching Module memory (RODD). The model provided with this package provides a estimation tool to evaluate specific architectures. It is possible for this approach to exhaust memory or disk resources in some instances.

   The implication of exhaustion is a switch cannot grow further routing. trunking, or consider many new capabilities.

3. Operator AMA Consideration

   The 5ESS does not generate AMA records for local operator calls nor will it with the LCC-RAC workaround.

4. Not extensible to all operator platforms

   LCC-RAC only works with existing local operator signaling protocols (e.g. Modified FGC). Potential alternate providers that already own operator platforms that require a carrier code in interswitch operator signaling (EAOSS and MEA signaling) will not work in the LCC-RAC workaround. These providers may have to make equipment and/or configuration changes to entertain branded local service.

5. Special Services Issues:

   - To support code conversion of special service calls, alternate provider DASs must be created that mimic the switch owner's DASs (i.e. accesses the same PDIT/LDIT). With 99 DAS limit per-switch, the increased DAS usage may become a resource contention.

   - Providers that route special service calls over FGD trunks are sending intraLATA calls over a equal access facility. This is outside the supported equal access protocol. The following are known side-effects of this method:

⇒ These calls have no carrier code and can not be routed to access tandem switches.

⇒ If FGD AMA records are created, they will contain an all zeros carrier code which may be considered invalid at Revenue Account Offices. Generating no AMA record is a consideration.

⇒ Code conversion to a ten-digit number is required.

6. Class of Service Limitations

Some classes of service such as coin and hotel motel require appropriate controls signals be exchanged with the switch. LCC-RAC cannot be used to divert these calls to trunks that do not support the control signals. There are other service classes such as data related services that may not be reasonable for LEC resale.

7. Local 555 Service unavailable

Local 555 directory assistance (call type DA) cannot be routed over FGD trunks.

8. Long Term Solutions

Once a industry or long-term solution for LEC Resale is available, the recent change effort should be reversed to restore memory resources. Effort will be required to move all alternate provider lines into original line classes, remove all screening, and other database work.

9. LCC-RAC is a **line only** workaround.

## 4. 1A ESS Workaround

The 1A ESS workaround and related issues are described in Attachment 3.

## *1.1. Model Introduction*

Before the model can be executed, the input parameters must be determined through either empirical estimation of the values or retrieving real switch data. The determined values must be below the maximums values allowed by the 5ESS. If data exceeds these maximums, the model user must either realistically reduce the values or fail this set of data as not being possible for the 5ESS LCC-RAC workaround. The closer the inputs values are to real switch data, the better the model forecasts memory consumption of LCC-RAC.

Empirical estimates of the input values tend to give higher memory consumption results. The nature of relational databases are the primary factor in higher values. The keys in a multiple key database form a table. This table might not be fully populated for all key values. In empirical estimation where the keys are quantities, the quantities are multiplied together giving the result of a fully populated table.

This occurs in the case of Screening Codes (SC), Code Destination Indices (CDI), and Number or Prefixes which are the keys of the RT_SCRNING table. If a switch had a 100 SCs, 100 CDIs, 3 Prefixes an empirical model execution would determine that 3000 RT_SCRNING tuples exist in the table. This is possible in the switch setup, but specific implementations may not be 100% full. Only real switch data will resolve this limitation. The "Improved Model Accuracy for Screening" section addresses this issue.

This model estimates the memory consumption of the LCC-RAC workaround and is intended for planning purposes only. It is the user's role to accurately determine the inputs and execute the model. When inputs are accurate, the model's goal is expected to provide a memory growth estimate within +/-20 percent of actual growth. The model is documented here but is also available in spreadsheet form.

## *1.2. Model Equation Format*

The model contains equations with input variables, constants, and tuple sizes (byte) that estimate the memory growth of particular relations (byte). These are later summed generating the outputs discussed in a subsequent section. Input variables have a 'i' prefix, constants a 'c' prefix, and tuple sizes are numeric with no prefix. Each equation is divided by a Memory Utilization Ratio.

The following is a example equation:

RC_EXAMPLE
LINE n: ((i1 * i2) * c2 * 32) / .65 = _____

where RC_EXAMPLE is the database relation being modeled;
LINE n is the line number;
i1 and i2 are input variables;
c2 is the really the constant 2;
32 is the tuple size of RC_EXAMPLE;
.65 is the Memory Utilization Ratio (described next).

assume i1 = 10 and i2 = 4 then equation translates to

LINE1: (( 10 * 4) * 2 * 32 ) / .65 = 3938.46 (round up to 3939)

At the end of the equations, you will be asked to sum various lines to determine impacted memory areas.

## *1.3. Memory Utilization Ratio*

The memory equations contain a factoring component know as the Memory Utilization Ratio (MUR). This factor accounts for the following elements of 5ESS memory management:

- Data management techniques have overheads (such as pointers and index tables) that consume memory.
- Memory is allocated in predefined blocks sizes. Depending on the selection of key values, memory blocks may be sparsely populated with data.

The MUR factors can be office dependent and the MUR values used in the model are based on modeling experiences for memory requirements.

## *1.4. Non-Model Parameter Descriptions*

Below are non-model parameter descriptions that require switch specific data and should not be empirically estimated. These parameters along with Model parameters are used in the "Maximum Boundary Test" section. For a specific switch implementation they will tell the user if critical switch resources are exhausted. These parameters are not used in determining incremental memory consumption.

**Number of Screen Codes (#SCs)**

This is total number of SCs found in the existing switch.

**Number of Digit Analysis Selectors (#DAS)**

This is the total number of DASs used in the existing office.

## *1.5. Model Parameter Descriptions*

The following parameters are used in the memory consumption model for LCC-RAC. It is assumed that the parameters are representing one switch. To the right of each item is a mnemonic (e.g. #ALCC) and the actual model input variable name (i<number>). Input names correspond to those found in the text and spreadsheet versions.

**Number of Alternate Provider Line Class Codes (#ALCC - i1)**

This is the number of LCCs an alternate provider intends on serving. For example, an alternate provider may request to serve all LCC on a switch or only a subset of the LCCs.

**Number of Alternate Provider Rate Centers (#ARAC - i2)**

This is the number of rate centers an alternate provider intends to serve in a single switch. For example, an alternate provider may desire to service all RACs on a switch or a subset.

**Number of Alternate Provider Screen Codes (#ASCs - i3)**

This is number of SCs the existing switch owner has associated with the LCCs and RACs the alternate provider intends to serve. These SCs will be replicated for the alternate provider.

**Number of Screening Prefixes (#PREFIX - i3a)**

The number of prefixing codes (NONE, 0+, 1+) used in screening. This parameter will normally be 3 but has been left as a option.

**Code Destination Indices (#CDIs - i4)**

This is the quantity of CDIs found in the PDITs and LDITs associated with the DASs for the LCC-RACs the provider intends to serve.

**Number of Alternate Providers (#PROV - i5)**

This is the number of alternate providers. This will be (1) for analyzing the incremental memory consumption of an alternate provider. If multiple providers are considered, they must be entering the LEC Resale market identically (e.g. same LCC-RACs, #trunks, ...). Alternatively, each alternate provider can be analyzed by the model and results summed for total incremental memory consumption.

**Number of Code Converts (#CONV - i6)**

How many special service code conversions are needed for the alternate provider. If an alternate provider was considering 411 and 611 service, the value would be 2.

**Number of Trunks Groups (#TGS - i8)**

The is the quantity of trunk groups added to access the alternate provider's resources. For example, an alternate provider might ask to add local operator trunks or FGD trunks for special services.

**Number of Trunks (#TRKS - i9)**

This is the number of trunk members added to new or existing trunk groups for an alternate provider's resource.

**Number of Alternate Provider Digit Analysis Selectors (#ADAS - i10)**

This is the number of DASs the existing switch owner has associated with the LCCs and RACs the alternate provider intends to serve. These DASs will be replicated when code conversion is used for special services.

If the alternate provider will not be handling special services calls (e.g.411/611/...), the value of ADAS is (0) since no DAS replication is necessary.

**Number of Route Indices (#RTI - i7)**

This is the number of route indices being added for the alternate provider. For example, this value would be (2) if an alternate provider is requesting a new operator route index and a new FGD route index that does not overflow to an access tandem.

**Number of Large Trunk Groups (#LGTG - i11)**

For the new trunk groups added (see #TGS - i8), how many of these will have more than 95 trunk members. For example, if one of the trunk groups had 120 trunk members, this value would be (1).

**Number of Small Trunk Groups (#SMTG - i12)**

For the new trunk groups added (see #TGS - i8), how many of these will have less than or equal to 95 trunk members. For example, if two trunk groups were added with 24 members each, this value would be (2).

**5ESS Generic Release (RELEASE - i13)**

The 5ESS release can be 5E9.1, 5E9.2, and 5E10.1. The generic release impacts the set of equations executed because items such as tuple size may change between releases.

## *1.6. Improved Model Accuracy for Screening*

In a earlier section, the assumption of full tables was discussed in regard to the model. The rate and route table (screening: RT_SCRNING) is a table that the model treats as being full. This may not be the case in all offices.

The RT_SCRNING relation is keyed by SC, CDI, and Prefix. The model multiplies the #ASC * #CDI * #PREFIX(normally 3) giving the result of a full table. Real switch data consisting of the actual tuple count in the RT_SCRNING relation for alternate provider screen codes can replace that calculation. This will improve model accuracy. In totaling the RT_SCRNING tuples, each prefix entry (NONE,1+,and 0+) is considered a separate tuple.

In the text model, the RT_SCRNING tuple count would replace the i3 * i4 * i3a portion of the LINE 2 equation.

In the spreadsheet tool, the input variables must be modified to cause the tuple count to replace the full calculation. This is done by setting:

i3 = RT_SCRNING tuple count
i4 = 1
i3a = 1

When the spreadsheet performs the i3 * i4 * i3a calculation, the result is the RT_SCRNING tuple count.

### *1.7. Maximum Boundary Tests*

If non-Model parameters were determined for a real switch, check that no boundary tests (below) fail. When this data is not available, the memory consumption model can still be executed.

If any boundary tests fail, the switch is completely out of a critical switch resource. The switch will not be capable of implementing LCC-RAC or the alternate provider's configuration must be re-engineered. These checks are not related to memory consumption.

1. DAS increase within limits

   Is Maximum #DASs (99) - #DASs < (#ADASs * #PROV)

2. SC increase within limits

   Is Maximum #SCs (4095) - #SCs < (#ASCs * #PROV)

## 2. LCC-RAC Memory Consumption Model

| Model Inputs | Input Value |
|---|---|
| i1) Number of Alternate Provider Line Class Codes (#ALCC) | _____ |
| i2) Number of Alternate Provider Rate Centers (#ARAC) | _____ |
| i3) Number of Alternate Provider Screen Codes (#ASCs) | _____ |
| i3a) Number of Screening Prefixes (#PREFIX) | _____ |
| i4) Code Destination Indices (#CDIs) | _____ |
| i5) Number of Alternate Providers (#PROV) | _____ |
| i6) Number of Code Converts (#CONV) | _____ |
| i7) Number of Route Indices (#RTI) | _____ |
| i8) Number of Trunk Groups (#TGS) | _____ |
| i9) Number of Trunks (#TRKS) | _____ |
| i10) Number of Alternate Provider Digit Analysis Selectors (#ADAS) | _____ |
| i11) Number of Large Trunk Groups (#LGTG) | _____ |
| i12) Number of Small Trunks Groups (#SMTG) | _____ |
| i13) 5ESS Generic Release (RELEASE) 5E9.1, 5E9.2 or 5E10 | _____ |

# 5E9.1 ALGORITHM

RC_LCC
LINE 1: ((i1 * i2) * i5 * 32) / .65 = _____

RT_SCRNING, RC_SCRN (SCRN_R, REM_G)
LINE 2: ((i3 * i4) * i5 * i3a * 4) / .60 = _____
LINE 3: ((i3 * i4) * i5 * 2) / .60 = _____
LINE 3a: if i3 * i4 * i5 < 100 then (i3 * i4 * i5 * 20) / .80 = _____
if i3 * i4 * i5 >= 100 then ((c100) * 20) / .80 = _____

DA_3DIGIT
LINE 4: (i6 * i5 * 8) / .20 = _____

RC_CVRMK
LINE 5: (i6 * i5 * 24) / .20 = _____

RC_DAS
LINE 6: (i10 * i5 * 24) / .40 = _____

RT_ROUTING, RCRTIRMK
LINE 7: (i7 * i5 * 24) / .60 = _____
LINE 8: (i7 * i5 * 20) / .80 = _____

RT_TRKG, RCTGRPRK (TGRPRK_R)
LINE 9: (i8 * i5 * 48) / .55 = _____
LINE 10: (i8 * i5 * 40) / .60 = _____

FC_OPERTRK, FC_PORTTYP (PRTTYP_R). FC_TRUNK
LINE 11: (i9 * i5 * 8) / .20 = _____
LINE 12: (i9 * i5 * 8) / .88 = _____
LINE 13: (i9 * i5 * 36) / .80 = _____
LINE 13a: (0) for 5E9.1 = _____

GROUP_PORT (GPRT_R), PORT_GROUP (PGGP_R)
LINE 14: (i9 * i5 * 12) / .18 = _____
LINE 15: (i9 * i5 * 4) / .18 = _____

PCTRKTXC
LINE 16: (i9 * i5 * 2) / .20 = _____

RC_EQLOC (EQLOC_R)
LINE 17: (i9 * i5 * 4) / .10 = _____

RC_LOCEQ
LINE 18: (i9 * i5 * 24) / .30 = _____

RC_TKTXC
LINE 19: (i9 * i5 * 8) / .20 = _____

RC_TRK (RCTRK_R)
LINE 20: (i9 * i5 * 4) / .40 = _____

TKSTAT
LINE 21: (i12 * i5 * 64) / .57 = _____

LGTKSTAT
LINE 22: (i11 * i5 * 512) / .57 = _____

# 5E9.2 ALGORITHM

RC_LCC
LINE 1: ((i1 * i2) * i5 * 32) / .65 = _____

RT_SCRNING, RC_SCRN (SCRN_R, REM_G)
LINE 2: ((i3 * i4) * i5 * i3a * 4) / .60 = _____
LINE 3: ((i3 * i4) * i5 * 2) / .60 = _____
LINE 3a: if i3 * i4 * i5 < 100 then (i3 * i4 * i5 * 20) / .80 = _____
if i3 * i4 * i5 >= 100 then ((c100) * 20) / .80 = _____

DA_3DIGIT
LINE 4: (i6 * i5 * 8) / .20 = _____

RC_CVRMK
LINE 5: (i6 * i5 * 24) / .20 = _____

RC_DAS
LINE 6: (i10 * i5 * 24) / .40 = _____

RT_ROUTING, RCRTIRMK
LINE 7: (i7 * i5 * 24) / .60 = _____
LINE 8: (i7 * i5 * 20) / .80 = _____

RT_TRKG, RCTGRPRK (TGRPRK_R)
LINE 9: (i8 * i5 * 52) / .55 = _____
LINE 10: (i8 * i5 * 40) / .60 = _____

FC_OPERTRK, FC_PORTTYP (PRTTYP_R), FC_TRUNK (FCTRNK_R)
LINE 11: (i9 * i5 * 8) / .20 = _____
LINE 12: (i9 * i5 * 12) / .88 = _____
LINE 13: (i9 * i5 * 12) / .80 = _____
LINE 13A: if i9 * i5 < 100 then (i9 * i5 * 24) / .80 = _____
if i9 * i5 >= 100 then ((c100) * 24) / .80 = _____

GROUP_PORT (GPRT_R), PORT_GROUP (PGGP_R)
LINE 14: (i9 * i5 * 16) / .18 = _____
LINE 15: (i9 * i5 * 4) / .18 = _____

PCTRKTXC
LINE 16: (i9 * i5 * 2) / .20 = _____

RC_EQLOC (EQLOC_R)
LINE 17: (i9 * i5 * 4) / .10 = _____

RC_LOCEQ
LINE 18: (i9 * i5 * 28) / .30 = _____

RC_TKTXC
LINE 19: (i9 * i5 * 8) / .20 = _____

RC_TRK (RCTRK_R)
LINE 20: (i9 * i5 * 4) / .40 = _____

TKSTAT
LINE 21: (i12 * i5 * 64) / .57 = _____

LGTKSTAT
LINE 22: (i11 * i5 * 512) / .57 = _____

# 5E10.1 ALGORITHM

RC_LCC
LINE 1: ((i1 * i2) * i5 * 32) / .65 = _____

RT_SCRNING, RC_SCRN (SCRN_R, REM_G)
LINE 2: ((i3 * i4) * i5 * i3a * 8) / .60 = _____
LINE 3: ((i3 * i4) * i5 * 2) / .60 = _____
LINE 3a: if i3 * i4 * i5 < 100 then (i3 * i4 * i5 * 20) / .80 = _____
if i3 * i4 * i5 >= 100 then ((c100) * 20) / .80 = _____

DA_3DIGIT
LINE 4: (i6 * i5 * 8) / .20 = _____

RC_CVRMK
LINE 5: (i6 * i5 * 24) / .20 = _____

RC_DAS
LINE 6: (i10 * i5 * 24) / .40 = _____

RT_ROUTING, RCRTIRMK
LINE 7: (i7 * i5 * 24) / .60 = _____
LINE 8: (i7 * i5 * 20) / .80 = _____

RT_TRKG, RCTGRPRK (TGRPRK_R)
LINE 9: (i8 * i5 * 52) / .55 = _____
LINE 10: (i8 * i5 * 40) / .60 = _____

FC_OPERTRK, FC_PORTTYP (PRTTYP_R), FC_TRUNK (FCTRNK_R)
LINE 11: (i9 * i5 * 8) / .20 = _____
LINE 12: (i9 * i5 * 12) / .88 = _____
LINE 13: (i9 * i5 * 12) / .80 = _____
LINE 13A: if i9 < 100 then (i9 * i5 * 28) / .80 = _____
if i9 >= 100 then ((c100) * 28) / .80 = _____

GROUP_PORT (GPRT_R), PORT_GROUP (PGGP_R)
LINE 14: (i9 * i5 * 16) / .18 = _____
LINE 15: (i9 * i5 * 4) / .18 = _____

PCTRKTXC
LINE 16: (i9 * i5 * 2) / .20 = _____

RC_EQLOC (EQLOC_R)
LINE 17: (i9 * i5 * 4) / .10 = _____

RC_LOCEQ
LINE 18: (i9 * i5 * 28) / .30 = _____

RC_TKTXC
LINE 19: (i9 * i5 * 8) / .20 = _____

RC_TRK (RCTRK_R)
LINE 20: (i9 * i5 * 4) / .40 = _____

TKSTAT
LINE 21: (i12 * i5 * 64) / .57 = _____

LGTKSTAT
LINE 22: (i11 * i5 * 512) / .57 = _____

## Model Outputs

The model estimation will output the byte growth in five outputs:

1. Administrative Module (AM) Memory Growth
2. Communications Module Processor (CMP) Memory Growth
3. Switch Module Redundant ODD (RODD) Memory Growth
4. Switch Module Non-Redundant ODD (NRODD) Memory Growth
5. Switch Module Dynamic or Unprotected ODD (UODD) Memory Growth

AM Memory Growth = SUM(LINE 3, LINE 3a, LINE 9, LINE 10, LINE 16, LINE 17, LINE 18, LINE 19, LINE 20)
AM Memory Growth = _____

CMP Memory Growth = SUM(LINE 1, LINE 5, LINE 6, LINE 7, LINE 8, LINE 9, LINE 14, LINE 15, LINE 17)
CMP Memory Growth = _____

RODD Memory Growth = SUM(LINE 2, LINE 4, LINE 7, LINE 9)
RODD Memory Growth = _____

NRODD Memory Growth = SUM(LINE 11, LINE 12, LINE 13, LINE 13A, LINE 14, LINE 15, LINE 16, LINE 18)
NRODD Memory Growth = _____

UODD Memory Growth = SUM(LINE 21, LINE 22)
UODD Memory Growth= _____

# 3. Model Output Analysis

## *3.1. Installed Memory*

To determine if these growth values are in acceptable bounds for a existing 5ESS switch, the correct memory size and configuration must be known for the AM, CMP, and SMs. The SMs have three memory growth areas of concern: redundant, non-redundant, and unprotected. The current memory sizes can be obtained by executing the OP:ODD input message on the 5ESS. Attachment gives some tips on reading OP:ODD outputs. The OP:ODD output does not provide processor information for determining pack types or current setup (e.g. #memory packs).

Compare the model's estimated growth with the switches available memory. This determines if the switch has sufficient memory to accommodate the alternate provider without memory growth.

## *3.2. Maximum Comparison*

Existing switch memory may not be sufficient for the alternate provider(s). To determine if the 5ESS can grow memory resources, compare the total memory demand (existing switch memory + model's growth estimate) to the maximum 5ESS
configurations (AM, CMP, SMs). This information is provided on a per-generic basis in Table 2. This total memory
must be able to fit in a maximum configured office to consider growth possibilities.

## *3.3. Memory and Equipment Growth*

5ESS switches may need to grow memory to support translations for alternate providers. The 5ESS SM has had several processor board changes that impact the maximum size of the ODD. Tables 3, 4, and 5 provide growth details for generics 5E9.1, 5E9.2, and 5E10.1. Use the information to determine feasibility of growing switch memory.

Growing ODD memory may create a need to expand disk memory on the 5ESS. Tables 3, 4, and 5 also contains a description of base and optional disk configurations possible. Sufficient disk space must be available for the planned SM memory growths due to alternate providers.

Standard 5ESS procedures should be following when doing memory and disk growth.

**Table 1 - OP:ODD COMMAND**

OP:ODD COMMAND

The OP:ODD input command is used to request the ODD availability in the AM, SM(s), or CMP, or any combination of the three. The format of the command is:

OP:ODD,(AM|SM=a[&&b]|CMP=a[&&b]), where a = SM or CMP number, or the lower limit of a range of numbers, and b = upper limit of the range of SM or CMP.

The output of the OP:ODD command for the AM is:

For the AM static ODD: AM SODD USED=xxx AVAIL=yyy PCT USED=zzz

For the AM dynamic ODD: AM UODD USED=xxx AVAIL=yyy PCT USED=zzz

For the AM Disk ODD: AM SODD USED=xxx AVAIL=yyy PCT USED=zzz

The output of the OP:ODD command for an SM is:

For the SM RODD, NRODD, and UODD:

SM RODD USED=xxx AVAIL=yyy PCT USED=zzz

| | NRODD USED | NRODD AVAIL | PCT USED | UODD USED | UODD AVAIL | PCT USED | UNALLOC | SABM |
|---|---|---|---|---|---|---|---|---|
| SM a | xx | xx | xx | xx | xx | xx | xx | xx |
| SM b | yy | yy | yy | yy | yy | yy | yy | yy |

The output of the OP:ODD command for the CMP is:

For the CMP NRODD, and UODD:

| | NRODD USED | NRODD AVAIL | PCT USED | UODD USED | UODD AVAIL | PCT USED | UNALLOC | SABM |
|---|---|---|---|---|---|---|---|---|
| CMP a | xx | xx | xx | xx | xx | xx | | |
| CMP b | yy | yy | yy | yy | yy | yy | | |

## TABLE 2 - MAXIMUM ODD SIZES

MAXIMUM ODD SIZES ALLOWABLE BY DB

AM & CMP

For all hardware configurations and generics, the max for the AM is 6 meg, and the CMP is 8 meg (the CMP is fixed at 8 meg, not growable, where the AM may be less than 6 meg and growable up to 6 meg).

SMs

For all hardware configurations and the 5e9(1) generic and earlier, the RODD max is 4 meg, and the NRODD + UODD max is 10 meg. The RODD, NRODD, and UODD are variable in size and may be grown.

For all hardware configurations and the 5e9(2) generic, the RODD max is 4 meg, and the NRODD + ODD max is 64 meg. The RODD, NRODD, and UODD are variable in size and may be grown.

For all hardware configurations and the 5e10(1) generic, the RODD max is currently 4 meg, but a Software Update (SU) is in the works to increase it to 8 meg, and the NRODD + UODD max is 64 meg. The RODD, NRODD, and UODD are variable in size and may be grown. The increase in RODD is to accommodate the increasing size of RT_SCRNING.

For all hardware configurations and the 5e11(1) generic, the RODD max is 8 meg, and the NRODD + UODD max is 64 meg. The RODD, NRODD, and UODD are variable in size and may be grown. Additionally, in 5e11(1), RT_SCRNING will be made into an OPVIEW to conserve RODD memory.

## TABLE 3 - 5E9.1 SM MEMORY AND EQUIPMENT

Table A - SM Processor Equipage

| SM | Processor (Note 1) | Memory Boards (Note 2) | Max. Slots | Max. Equipage (MB) (Note 3) |
|---|---|---|---|---|
| SMP12 | 68012 | TN56 | 5 + 7 | 24* |
| | | TN2012 | 5 + 3 | 32* |
| SMP23 | 68020 | TN56 | 5 + 7 | 24* |
| | | TN2012 | 5 + 3 | 32* |
| | SMP23CDM | TN1423 | 1 | 32 |
| SMP20 | 68020 | TN1374 | 6 | 24 |
| SMP20DC | | TN1376 | 6 | 48 |
| | | TN1661 | 6 | 96 |

Notes:
1. Processor addressability limits: 68012 & 68023 - 32 MB, 68020 - 4 GB, 68040 - 784 MB.
2. TN56 = 2MB, TN2012 = 4 MB, TN1374 = 4 MB, TN1376 = 8 MB, TN1661 = 16 MB, TN1423 = 32 MB.
   The TN1374, TN1376, and TN1661 boards may be mixed in the same MCTU2 (68020). The other boards are not mixable.
3. Maximum equipage (*) requires the use of the MEU (Memory Expansion Unit).
4. The switch must be on 5E9(1) before the TN1423 can be used.

TABLE 1

5E9(1) Disk Capacities
Base Configurations

| Base Config. | Minimum Disk Pairs | SM ODD (MB) | AMA (MB) |
|---|---|---|---|
| 63 | 2 | 48 | 39 |
| 66 | 2 | 213 | 155 |

63 is 600 MB SCSI, 322 MB SCSI or 340 MB SMD and
66 is 600 MB SCSI, 600 MB SCSI.

TABLE 2

Optional Disk Layouts

| 63 Layout | SM ODD (MB) | AMA (MB) | % SM ODD to % AMA | 66 Layout | SM ODD (MB) | AMA (MB) |
|---|---|---|---|---|---|---|
| 0300 | 0 | 264 | 0/100 | 0600 | 0 | 576 |
| 0325 | 62 | 192 | 25/75 | 0625 | 134 | 432 |
| 0350 | 126 | 128 | 50/50 | 0650 | 278 | 288 |
| 0375 | 190 | 64 | 75/25 | 0675 | 422 | 144 |
| 03100 | 254 | 0 | 100/0 | 06100 | 502 | 0 |

## TABLE 4 - 5E9.2 SM MEMORY AND EQUIPMENT

Table A - SM Processor Equipage

| SM | Processor (Note 1) | Memory Boards (Note 2) | Max. Slots | Max. Equipage (MB) (Note 3) |
|---|---|---|---|---|
| SMP12 | 68012 | TN56 | 5 + 7 | 24* |
| | | TN2012 | 5 + 3 | 32* |
| SMP23 | 68020 | TN56 | 5 + 7 | 24* |
| | | TN2012 | 5 + 3 | 32* |
| | SMP23CDM | TN1423 | 1 | 32 |
| SMP20 SMP20DC | 68020 | TN1374 | 6 | 24 |
| | | TN1376 | 6 | 48 |
| | | TN1661 | 6 | 96 |
| SMP40 | 68040 | TN1685 | 4 | 128 |

Notes:
1. Processor addressability limits: 68012 & 68023 - 32 MB, 68020 - 4 GB, 68040 - 784 MB.
2. TN56 = 2MB, TN2012 = 4 MB, TN1374 = 4 MB, TN1376 = 8 MB, TN1661 = 16 MB, TN1423 = 32 MB, TN1685 = 32 MB. The TN1374, TN1376, and TN1661 boards may be mixed in the same MCTU2 (68020). The other boards are not mixable.
3. Maximum equipage (*) requires the use of the MEU (Memory Expansion Unit).

TABLE 1

5E9(2) Disk Capacities
Base Configurations

| Base Config. | Minimum Disk Pairs | SM ODD (MB) | AMA (MB) |
|---|---|---|---|
| 63 | 2 | 52 | 52 |
| 66 | 2 | 245 | 125 |

For 3B20D:
63 is 600 MB SCSI, 322 MB SCSI or 340 MB SMD.
66 is 3.5" 1 GB SCSI or 600 MB SCSI, 3.5" 1 GB SCSI or 600 MB SCSI.
For 3B21D:
66 is 1 GB SCSI, 1 GB SCSI for 3B21D.

TABLE 2

Optional Disk Layouts
(Same as 5E9(1).)

63 SM ODD AMA % SM ODD 66 SM ODD AMA

| Layout | (MB) | (MB) | to % AMA | Layout | (MB) | (MB) |
|---|---|---|---|---|---|---|
| 0300 | 0 | 264 | 0/100 | 0600 | 0 | 576 |
| 0325 | 62 | 192 | 25/75 | 0625 | 134 | 432 |
| 0350 | 126 | 128 | 50/50 | 0650 | 278 | 288 |
| 0375 | 190 | 64 | 75/25 | 0675 | 422 | 144 |
| 03100 | 254 | 0 | 100/0 | 06100 | | |

## TABLE 5 - 5E10 SM MEMORY AND EQUIPMENT

Table A - SM Processor Equipage

| SM | Processor (Note 1) | Memory Boards (Note 2) | Max. Slots (Note 3) | Max. Equipage (MB) (Note 4) |
|---|---|---|---|---|
| SMP12 | 68012 | TN56 | 5 + 7 | 24** |
| | | TN2012 | 5 + 3 | 32** |
| SMP23 | 68020 | TN56 | 5 + 7 | 24** |
| | | TN2012 | 5 + 3 | 32** |
| | SMP23CDM | TN1423 | 1 | 32 |
| SMP20 | 68020 | TN1374 | 6 | 24 |
| SMP20DC | | TN1376 | 6 | 48 |
| | | TN1661 | 6 | 96 |
| SB20CORE | 68LC040 | KBN* | 1-3 | 96 |
| CORE40 | 68040 | TN1685 | 4 | 256 |
| | | TN1806 | 4 | 256 |
| CORE60 | 68060*** | TN1685 | 4 | 256 |
| | | TN1806 | 4 | 256 |

Notes:

1. Processor addressability limits: 68012 & 68023 - 32 MB, 68020 - 4 GB, SB20CORE/ CORE40/ CORE60 - 784 MB.
2. TN56 = 2MB, TN2012 = 4 MB, TN1423 = 32 MB, TN1374 = 4 MB, TN1376 = 8 MB, TN1661 = 16 MB, TN1685 = 32 MB, TN1806 = 64 MB.
   The TN1374, TN1376, and TN1661 boards may be mixed in the same MCTU2 (68020). The TN1685 and TN1806 boards may be mixed in the same CORE40/60. The other boards are not mixable. The TN1423 is a new microprocessor board with with dynamic memory.
3. (*) The KBN20 is a processor board in the MCTU3 with 1 memory module of 32 MB. KBN21 is the same processor board equipped with 2 memory modules for 64 MB.
4. Maximum equipage (**) requires the use of the MEU (Memory Expansion Unit).
5. The CORE60 (***) comes with 64 MB of memory resident on the core board. Add one TN1685 for 96 MB. Add one TN1806 or two TN1685s for 128 MB of total memory.

TABLE 1

5E10 Disk Capacities
Base Configurations

| Base Config. | Minimum Disk Pairs | SM ODD (MB) | AMA (MB) |
|---|---|---|---|
| 63 | 2 | 58 | 35 |
| 66 | 2 | 245 | 149 |
| 1010 | 2 | 344 | 626 |

For 3B20D:
63 is 600 MB SCSI, 322 MB SCSI.
66 is 3.5" 1 GB SCSI or 600 MB SCSI, 3.5" 1 GB SCSI or 600 MB SCSI.
For 3B21D:
1010 is 1 GB SCSI, 1 GB SCSI for 3B21D.

TABLE 2

Optional Disk Layouts

| 63 Layout | SM ODD (MB) | AMA (MB) | % SM ODD to % AMA | 66 Layout | SM ODD (MB) | AMA (MB) |
|---|---|---|---|---|---|---|
| 0300 | 0 | 264 | 0/100 | 0600 | 0 | 576 |
| 0325 | 62 | 192 | 25/75 | 0625 | 134 | 432 |
| 0350 | 126 | 128 | 50/50 | 0650 | 278 | 288 |
| 0375 | 190 | 64 | 75/25 | 0675 | 422 | 144 |
| 03100 | 254 | 0 | 100/0 | 06100 | 502 | 0 |

| 1010 Layout | SM ODD (MB) | AMA (MB) | % SM ODD to % AMA |
|---|---|---|---|
| 1000 | 0 | 1001 | 0/100 |
| 1025 | 240 | 751 | 25/75 |
| 1050 | 490 | 500 | 50/50 |

# 1. 1A ESS™ Switch Alternate Local Service Provider Description

The approach for the 1A ESS™ Switch involves creating new classes of service for the alternate local service provider(s) and then using normal switch screening capabilities to select routes for 0- and local 0+ calls that terminate on the operator system of the alternate service provider. The method uses what the switch considers alternate LEC routing and will not produce an access charge AMA record. An approach using an alternate digit tree is not a possibility for the 1A ESS Switch since a digit tree (known as a Rate Center - RAC) is assigned to a group of a thousand numbers (NXX+D4) and not on an individual DN basis. An individual subscriber would require a number change in order to be associated with a new digit tree (RAC).

An alternate provider's 0- traffic can be routed using normal screening methods by assigning an alternate service provider's subscribers a unique class of service. This is possible since 0- is treated like any other 3 digit code in a RAC.

An alternate provider's 0+ traffic can be routed by assigning a unique 0+ routing data element known as the Traffic Service Position (TSP) Index to the class of service. However, at most only 8 of these indices are allowed. Other complications with this method are described below.

A method for "code converting" an alternate provider's special services (e.g., 411,611) cannot be supported on the 1A ESS Switch.

# 2. Memory Impact

The only new memory required for the 1A ESS Switch approach is for a structure called a Chart Class Column Table that is required for each new class of service. The Chart Class Column Table provides the TSP Index which is used in the algorithm for route selection on 0+ calls. In addition, using standard switch screening, the Chart Class Column Table for a given class of service can provide a 0- route for that class of service that is used in lieu of the office default 0- route. Each new Chart Class Column Table requires 64 words of memory. If for example 50 new Classes of service are required, the impact would be 3200 words (50 X 64).

There are 1023 available Chart Class Column tables in 1A, so this data element is not likely to become a limiting factor.

# 3. Issues

## *3.1. TSP Index Limitations*

The limiting factor for the 1A ESS switch is more likely to be the availability of TSP Indices. A total of 128 routes may be allocated to 0+ routing in 1A. However, these routes are accessed via an algorithm using 2 keys called TSP Index and TSP Group. The TSP Index represents the class of user (e.g. Coin lines) and the TSP Group represents class of call (e.g. IDDD). The TSP Group comes from a structure called the Rate and Route pattern that would not vary between the LEC and alternate service providers. It cannot vary because the Rate and Route Pattern is a function of the Rate Center and the dialed 3/6 digit code. As previously mentioned, the Rate Center cannot vary by DN in the 1A ESS Switch, but only in blocks of 1000 numbers.

The LEC gets to make a choice as to how the maximum 128 0+ routes that are available are split between varying the TSP Index and the TSP Group. The 3 choices available are:

| TSP Index Max | TSP Group Max |
|---|---|
| 2 | 64 |
| 4 | 32 |
| 8 | 16 |

That is, the number that can vary by class of service can have only at most 8 possible values. An alternate service provider would need a new TSP index to access different routes than the current LEC routing. The TSP Index is specified per class of service. The original purpose of this index was to distinguish Coin from non-Coin. However, other uses may have been devised by a given LEC for routing/screening purposes.

Since the actual route is accessed using an algorithm that multiplies the TSP Group by the TSP Index max chosen and then adds the TSP Index, there is also a certain amount of administrative pain involved if a LEC would have to change the split described above. In other words, going from a TSP Index max of 2 to a TSP Index max of 8 would involve "shuffling" the 128 possible routes. This may present challenges when shuffling these routes in a live office.

### *3.2. Operator AMA Consideration*

The 1A ESS Switch does not currently generate AMA records for local operator calls, nor will it under this proposal.

### *3.3. Not Extensible to all Operator Platforms*

The 1A ESS Switch approach will only support existing local operator signaling protocols. Other signaling methods (such as EAOSS and MEA) will not work under this proposal.

### *3.4. 611, 411 etc.*

The 1A ESS Switch proposal does not support separation of these services for alternate providers.

### *3.5. Long Term Solutions*

Once an industry or long-term solution for LEC Resale is available, the recent change effort should be reversed to restore resources. It would be a significant effort to move all alternate provider lines into original line classes and remove chart columns.

LCC-RAC Memory Model for Alternate Local Service

## Model Inputs

| | | Input Value |
|---|---|---|
| i1) | Number of Alternate Provider Line Class Codes (#ALCC) | 1 |
| i2) | Number of Alternate Provider Rate Centers (#ARAC) | 1 |
| i3) | Number of Alternate Provider Screen Codes (#ASCs) | 1 |
| i3a) | Number of Screening Prefixs (#PREFIX) | 1 |
| i4) | Code Destination Indexs (#CDIs) | 1 |
| i5) | Number of Alternate Providers (#PROV) | 1 |
| i6) | Number of Code Converts (#CONV) | 1 |
| i7) | Number of Route Indexs (#RTI) | 1 |
| i8) | Number of Trunks Groups (#TGS) | 1 |
| i9) | Number of Trunks (#TRKS) | 1 |
| i10) | Number of Alternate Provider Digit Analysis Selectors (#ADAS) | 1 |
| i11) | Number of Large Trunk Groups (#LGTG) | 1 |
| i12) | Number of Small Trunk Groups (#SMTG) | 1 |
| i13) | 5ESS Generic Release (RELEASE) 1=5E9.1 2=5E9.2 3=5E10 | 1 |

## Memory Calculations

| | | Calculation |
|---|---|---|
| | RC_LCC | |
| Line 1: | (( i1 * i2 ) * i5 * 32) / .65 = | 49.230769 |
| | RT_SCRNING, RC_SCRN(SCRN_R, REM_G) (default 3) | |
| Line 2: | (( i3 * i4 ) * i5 * i3a * x ) / .60 = 5E9.1and 5E9.2 x = 4, 5E10 x = 8 | 6.6666667 |
| Line 3: | (( i3 * i4 ) * i5 * 2 ) / .60 = | 3.3333333 |
| Line 3a: | if ( i3 * i4 * i5 ) < 100 then ( i3 * i4 * i5 * 20 ) / .80 = | 25 |
| | if ( i3 * i4 * i5 ) >= 100 then ( 100 * 20 ) / .80 = | |
| | DA_3DIGIT | |
| Line 4: | ( i6 * i5 * 8 ) / .20 = | 40 |

| | | |
|---|---|---|
| | RC_CVRMK | |
| Line 5: | ( i6 * i5 * 24 ) / .20 = | 120 |
| | | |
| | RC_DAS | |
| Line 6: | ( i10 * i5 * 24 ) / .40 = | 60 |
| | | |
| | RT_ROUTING, RCRTIRMK | |
| Line 7: | ( i7 * i5 * 24) / .60 = | 40 |
| Line 8: | ( i7 * i5 * 20 ) / .80 = | 25 |
| | | |
| | RT_TRKG, RCTGRPRK, (TGRPRK_R) | |
| Line 9: | ( i8 * i5 * x ) / .55 = 5E9.1x=48, 5E9.2 and 5E10 x=52 | 87.272727 |
| Line 10: | ( i8 * i5 * 40 ) / .60 = | 66.666667 |
| | | |
| | FC_OPERTRK, FC_PORTTYP (PRTTYP_R), FC_TRUNK | |
| Line 11: | ( i9 * i5 * 8 ) / .20 = | 40 |
| Line 12: | ( i9 * i5 * x ) / .88 = 5E9.1 x=8, 5E9.2 and 5E10 x=12 | 9.0909091 |
| Line 13: | ( i9 * i5 * x ) / .80 = 5E9.1 x=36, 5E9.2 and 5E10 x=12 | 45 |
| Line 13a | if ( i5 * i9 ) < 100 then ( i9 * i5 * x ) / .80 =5E9.1 x=0, 5E9.2 x=24, 5E10 x=28 | 0 |
| | if ( i5 * i9 ) >= 100 then ( 100 * x ) / .80 =5E9.1 x=0, 5E9.2 x=24, 5E10 x=28 | |
| | | |
| | GROUP_PORT, (GPRT_R), PORT_GROUP (PGGP_R) | |
| Line 14: | ( i9 * i5 * 12 ) / .18 = | 66.666667 |
| Line 15: | ( i9 * i5 * 4 ) / .18 = | 22.222222 |
| | | |
| | PCTRKTXC | |
| Line 16: | ( i9 * i5 * 2 ) / .20 = | 10 |
| | | |
| | RC_EQLOC (EQLOC_R) | |
| Line 17: | ( i9 * i5 * 4 ) / .10 = | 40 |
| | | |
| | RC_LOCEQ | |
| Line 18: | (i9 * i5 * x ) / .30 = 5E9.1 and 5E9.2 x=24, 5E10 x=28 | 80 |
| | | |
| | RC_TKTXC | |

| | | |
|---|---|---|
| Line 19: | ( i9 * i5 * 8 ) / .20 = | 40 |
| | RC_TRK (RCTRK_R) | |
| Line 20: | ( i9 * i5 * 4 ) / .40 = | 10 |
| | TKSTAT | |
| Line 21: | ( i12 * i5 * 64 ) / .57 = | 112.2807 |
| | LGTKSTAT | |
| Line 22: | ( i11 * i5 * 512 ) / .57 = | 898.24561 |

## Memory Outputs

| | | |
|---|---|---|
| | Administrative Module (AM) Memory Growth | |
| o1) | L3 + L3a + L9 + L10 + L16 + L17 + L18 + L19 + L20 = | 362.27273 |
| | Communications Module Processor (CMP) Memory Growth | |
| o2) | L1 + L5 + L6 + L7 + L8 + L9 + L14 + L15 + L17 = | 510.39239 |
| | Switch Module Redundant ODD (RODD) Memory Growth | |
| o3) | L2 + L4 + L7 + L9 = | 173.93939 |
| | Switch Module Non-Redundant ODD (NRODD) Memory Growth | |
| o4) | L11 + L12 + L13 + L13a + L14 + L15 + L16 + L18 = | 272.9798 |
| o5) | Switch Module Dynamic or Unprotected ODD (UODD) Memory Growth | |
| | L21 + L22 = | 1010.5263 |

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF DOUGLAS N. MORRIS**

**DOCKET 960847-TP**

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

A. My name is Douglas N. Morris. My business address is 600 Hidden Ridge, Irving, TX, 75038.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations as Senior Product Manager - Advanced Services.

**Q. PLEASE DESCRIBE YOUR EDUCATION AND WORK EXPERIENCE.**

A. I received a Bachelor or Science degree in Engineering, with a specialty in Electrical Engineering, from the University of South Florida (USF), Tampa, Florida, in 1971. After graduation, I began my career with GTE Florida in Tampa, Florida, as Central Office Equipment Engineer. After holding positions of increasing responsibility in Engineering and Planning in GTE Florida, I was promoted to GTE Service Corporation, Stamford, Connecticut, in 1977, as Systems Engineer - Development. I held positions of increasing responsibility with GTE Service Corporation in Support Systems Planning, Capital Planning, Network Services Planning, and Business and Strategic Planning until 1988, when I

transferred to GTE Information Services, Tampa, Florida, as Senior Manager - Technical Planning. I moved to the GTE Telecommunication Services Incorporated business unit in 1990, as Industry Affairs Manager. In 1992, I transferred to GTE Telephone Operations in Irving, Texas, to assume my current position.

I have obtained special knowledge and expertise of Signaling System 7 (SS7) technology through attendance at numerous courses and seminars presented by industry training experts (such as Bellcore), by participating in informational seminars held by switch and SS7 equipment manufacturers, and by working with GTE technical experts over the last 13 years.

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

A. My testimony presents GTE's position on unbundling of Signalling System 7 ("SS7") (as distinguished from the Advanced Intelligent Network ("AIN"), which is fundamentally different from SS7). I will first describe SS7, then restate the relevant provisions of the Act. I will next summarize the issues to be arbitrated and the parties' positions on each. Finally, I will set forth in detail GTE's position on unbundling SS7.

**Q. WHAT IS GTE'S GENERAL POSITION ON UNBUNDLING SS7 IN THIS ARBITRATION?**

A. The Telecommunications Act of 1996 (the Act) requires incumbent local exchange carriers (ILECs) to provide, on an unbundled basis, nondiscriminatory access to network elements at any technically feasible point. In its First Report and Order, the FCC interpreted the Act's unbundling provisions to require ILECs to provide unbundled access to Signaling Links (SLs) and Signaling Transfer Points (STPs). AT&T requests that GTE unbundle its SLs, STPs and Service Control Points (SCPs). However, the only physical point at which interconnection with an SS7 network is technically feasible without risking harm to the reliability and security of the network is the STP. SLs can be provided on an unbundled basis by interconnecting AT&T's Service Switching Points (SSPs) or STPs to GTE's signaling network at the STP.

**Q. WHAT IS SS7?**

A. SS7 is an advanced type of signaling. Signaling is the transmission of information required to direct and control the setup, administration and disconnection of a voice circuit. In other words, it is the communication of control information between elements of a communications network using a standard protocol understood by all signaling elements involved. Signaling functions include: (1) supervising (i.e., initiating a request for service such as on-hook or off-hook); (2) alerting (i.e., notification of activity on the circuit such as ringing); and (3) addressing (i.e.,

information provided to the communications system concerning the destination of the call, such as calling number via dial pulse, dual tone multi-frequency, or multi-frequency).

There are two broad types of signaling--the traditional, or in-band, signaling and the more advanced, out-of-band, signaling.

**Q. PLEASE DESCRIBE IN-BAND SIGNALING.**

A. Traditional signaling, shown in Exhibit No. DNM-1, carries signals between network nodes in the same circuit as the related voice conversation, and is referred to as "in-band" signaling. The signaling itself is carried by the voice circuit in the form of tones or other changes in electrical characteristics. Because the signaling and conversation cannot be transmitted at the same time, the signaling occurs before or after the conversation, or interrupts the conversation while it is in progress.

Some of the shortcomings of traditional signaling include its slow speed, its ability to transfer only limited information and long call set-up time, all of which result in an inefficient use of facilities and signaling equipment. Also, this type of signaling creates an opportunity for fraud because changes in the tones and electrical characteristics can be inserted into the circuit and affect the routing or content of other signaling information.

**Q. HAS TECHNOLOGY OVERCOME THE PROBLEMS ASSOCIATED WITH IN-BAND SIGNALING?**

A. Yes. The problems with traditional or "in-band" signaling have been overcome by the development of common channel signaling (CCS). As illustrated in Exhibit No. DNM-2, CCS is a technique of signaling which uses a common channel or network, separate from the voice channels used to transmit signals. This is called "out-of-band" signaling because the signaling and voice paths use separate networks or facilities. The advantages of "out-of-band" signaling over "in-band" signaling include the ability to handle a greater volume of signaling information, reduced call set-up times, more efficient trunk usage, and fraud reduction. These advantages result in more efficient and faster connections, and facilitate the provision of new services for subscribers.

**Q. HOW DOES OUT-OF-BAND SIGNALING RELATE TO SS7?**

A. SS7 is a standardized network architecture and protocol used by the international telecommunications industry to accomplish CCS (or "out-of-band" signaling). The SS7 network architecture and protocol were adopted by international and United States standards-setting bodies many years ago, and have been used in providing services or applications since their adoption.

**Q. WHAT IS THE ROLE OF THE INDUSTRY STANDARDS IN PRACTICE?**

A. Industry standards developed by United States standards bodies (e.g., American National Standards Institute or ANSI), and those developed by industry agreement (e.g., Bellcore), are developed in open fora with the participation of manufacturers, service providers, end users, government and other interested parties. The standards thus developed are recommended; there is no requirement or implementation schedule imposed on the user of the standards. The benefit of establishing standards is that participants in the network can reference a detailed description of a particular standard and understand what to expect from implementation of the standard. However, because other companies may have implemented other proprietary or non-standard approaches, this testimony addresses what can be accomplished within the GTE network and/or within current industry standards.

Q. **PLEASE DESCRIBE THE STANDARD SS7 NETWORK ARCHITECTURE.**

A. The SS7 network architecture, which is illustrated in Exhibit No. DNM-3, includes the following components:

- Signaling Point (SP). The Signaling Point is any node on an SS7 network (e.g., STP, SCP, end office, access tandem or operator system). SPs have SS7 signaling capabilities, but not necessarily the application software needed to

provide services to end-users.

- Service Switching Points (SSPs). Service Switching Points are SPs (end office, access tandem or operator system) which have both SS7 signaling capabilities and application-specific software to perform end-user services.

- Signaling Transfer Points (STP). The Signaling Transfer Point is a highly-reliable packet switch which is unique in the network in that it mediates, translates and routes signaling messages appropriately. STPs are provisioned in pairs to ensure reliability, redundancy and diversity. Each STP handles one-half of the signaling traffic so that if a link is damaged, the other STP in the mated pair is able to take over the signal switching and routing functions without compromising network reliability.

- Service Control Point (SCP). The Service Control Point is a computer system which is linked to its primary STP pair and provides access to the SCP's related database or databases.

There also are multiple links within the SS7 network, as shown in Exhibit No. DNM-3. These links can be described as follows:

- A-Links. A-Links, or Access links, are two links (one to each STP in the mated pair) from an SP or SSP to its primary STP pair.

- B-Links. B-Links, or Bridge Links, are four links between two mated STP pairs at the same levels of the signaling network hierarchy.

- C-Links. C-Links, or Cross Links, may be as few as one link between STPs of a mated pair.

- D-Links. D-Links, or Diagonal links, are four links between two mated STP pairs at different levels of the signaling network hierarchy.

- E-Links. E-Links, or Extension Links, are two links from an SP or SSP to its secondary STP pair. E-Links are generally not implemented in GTE's SS7 network.

- F-Links. F-Links, or Fully Associated Links, may be as little as one direct link between two SPs or SSPs. F-links are generally not implemented in GTE's SS7 network.

The original distinctions between B-Links and D-Links have faded with the development of gateway screening and increased

signaling network interconnection. Because B-Links and D-Links perform the same functions (i.e., interconnecting two STP pairs), the terms B-Link and D-Link are often used interchangeably.

**Q. PLEASE DESCRIBE THE SS7 NETWORK PROTOCOL.**

A. By way of introduction, a protocol is a formal set of rules for the exchange of information between networks or among network facilities. Protocols insure that a sender and receiver of *information are compatible* and that communication between the two will be intelligible. A protocol also includes procedures for establishing and maintaining the communication path, and provides error detection, correction and retransmission, if required. Lastly, protocols consist of procedure definitions to establish the appropriate communications and definitions of messages and message exchanges.

As illustrated in Exhibit No. DNM-4, the SS7 protocol has five major sub-protocol layers--the Message Transfer Part (MTP); the Signaling Connection Control Part (SCCP); the ISDN (Integrated Services Digital Network) User Part (ISUP); the Transaction Capabilities Application Part (TCAP); and the Operations and Maintenance Application Part (OMAP).

**Q. WHAT ARE THE ROLES OF EACH OF THESE SUB-PROTOCOL LAYERS?**

A. ISUP and TCAP are the higher-level service or application interface components of the SS7 protocol. MTP provides functions for basic routing of signaling messages between signaling points. SCCP provides additional routing and management functions for transfer of messages other than call set-up between signaling points. ISUP provides for transfer of call set-up signaling information between signaling points. TCAP provides transfer of non-circuit related information between signaling points. OMAP provides the functions, test procedures and protocols for the operation, maintenance, administration and provisioning of the CCS signaling network and switching offices.

ISUP, TCAP and OMAP are often referred to as the higher layers of the protocol, since they use the other, or lower layers. The lower layers are used by the higher layers of the protocol to ensure reliable message transport, error detection, error correction, retransmission and destination translation and routing.

Services or applications which use MTP, SCCP, ISUP, TCAP and/or OMAP must use defined portions of the protocol in the provision of the service or application. Services or applications may use multiple sub protocols. Messages and procedures must be defined and standardized for each service or application. There are error detection and correction messages, as well as operations, maintenance and administrative messages

transversing the signaling network at any particular time. Uses of the individual messages and the message lengths vary significantly. For example, TCAP messages start at the overhead level of 21 bytes, and may be as long as approximately 272 bytes. A single service may require multiple messages of various lengths, multiple uses of multiple protocol layers and multiple retries to attempt or complete a service.

**Q. HOW IS SS7 RELATED TO CLASS SERVICES?**

A. SmartCall services, which is the GTE trademark for a family of services, including services commonly referred to as CLASS (Custom Local Area Signaling Service), are performed by the end office switch in which the call is terminated. SS7 simply carries the calling party number in the transport of call set-up messages from the originating switch to the terminating switch. The terminating switch performs the SmartCall function subscribed to by the end user based on the calling party number transported by the SS7 network. The SS7 network does not perform CLASS services, but only carries calling party number information from the originating switch to the terminating switch, and the CLASS services are performed by the terminating switch.

**Q. WHAT ARE THE ILEC'S UNBUNDLING OBLIGATIONS UNDER THE ACT?**

A. The Act provides that each incumbent local exchange carrier (ILEC) has the duty "to provide, to any requesting *telecommunications carrier for* the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point." (Act at § 251 (c)(3) (1996). The Act further provides that,

> [i]n determining what network elements should be made available for purposes of subsection (c)(3), the [FCC] shall consider, at a minimum, whether --
>
> (A) access to such network elements as are proprietary in nature is necessary; and
>
> (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer. (Act at § 251(d)(2)(1996).

The FCC has interpreted these provisions to require ILECs to provide access to SS7 by purchasing local switching services from the ILEC or by unbundling signaling links and STPs. (See Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket No. 96-98, FCC 96-325 (released Aug. 8, 1996) ("Order") at ¶¶ 479-83.)

**Q. PLEASE LIST THE ISSUES PRESENTED IN THIS ARBITRATION AND THE POSITIONS OF THE PARTIES ON EACH OF THEM.**

A. The issues presented in this arbitration flow predominantly from the parties' differing views of the purposes and requirements of the Act. Notwithstanding GTE's willingness to interconnect SS7 networks at the STP and to provide database access at the STP, GTE is not required to unbundle SCPs. The specific issues about which the parties disagree are as follows:

1. *Is it technically feasible to unbundle GTE's SCP?*

**AT&T's Position:** Unbundling of all signaling elements, including the SCP, is technically feasible.

**GTE's Position:** Although access to the databases related to GTE's SCP may be made through a query to the SCP via interconnection with the corresponding STP pair, it is not currently technically feasible to provide SCPs on an unbundled basis.

2. *Is it technically feasible to unbundle GTE's STPs?*

**AT&T's Position:** Unbundling of all signaling elements, including the STPs, is technically feasible.

**GTE's Position:** Although interconnection between signaling networks is accomplished at GTE's STPs, it is not currently technically feasible to provide STPs on an unbundled basis.

3. *Is it technically feasible to unbundle GTE's signaling links?*

**AT&T's Position:** Unbundling of all signaling elements, including the SLs, is technically feasible.

**GTE's Position:** It is not currently technically feasible to unbundle SLs within the GTE signaling network. Interconnection with GTE's signaling network is possible, however, via unbundled signaling links connecting the AT&T switch (SSP) or STP to GTE's STP.

4. *Is it technically feasible to directly interconnect with GTE's SCPs?*

**AT&T's Position:** Direct interconnection with GTE's SCPs is technically feasible.

**GTE's Position:** Access to the databases related to GTE's SCP may made only through a query to the SCP via interconnection with the corresponding STP pair.

Interconnection to the SCP directly, however, is not technically feasible.

I will elaborate on each of GTE's positions in the following discussion.

**Q. WHY IS DIRECT INTERCONNECTION TO GTE'S SCPs TECHNICALLY INFEASIBLE?**

A. Today, interconnection with an SS7 network occurs at the STP, which was designed to be the entry point to an SS7 network and to provide access to all SS7 functions. The STP is the only physical point at which interconnection is technically feasible. The STP directs SS7 message flow and provides the necessary mediation functions by preventing passage of inexecutable or dangerous messages to the SCPs, rejecting inconsistent messages regarding the same end user, and preventing unauthorized access to proprietary information. Neither the SCP nor any other point in the SS7 network can perform these functions. Indeed, the FCC has acknowledged that "STPs perform important network screening functions," which should not be "decentralized" and performed at every switch. (Expanded Interconnection with Local Tel. Co. Facilities, 9 FCC Rcd 2718, 2725 (1994).)

In addition, the SCP is not technically capable of routing SS7 messages to multiple STP pairs. Access to the SCP and its

associated databases is technically feasible only through the STP pair associated with that SCP, whether the SCP is owned by the ILEC or another entity.

**Q. DOES THIS MEAN THAT OTHER CARRIERS CANNOT ACCESS GTE'S DATABASES?**

A. No. It only means that they have to do so through the STP. Unbundled access to GTE's 800 and LIDB databases is provided to other carriers today. This access requires interconnection to a GTE SS7 STP, using either GTE-provided links or links constructed by another provider. Providing direct access to the database or SCP raises network reliability issues due to the lack of industry standards. Standard interfaces exist for STP interconnection, but not for direct SCP interconnection. Interconnection to SCPs is a highly controversial issue at this time. Until appropriate mediation techniques and the associated software and hardware are developed to safeguard the network, access to SCPs or databases is not technically feasible.

**Q. ARE THERE OBJECTIVE LIMITATIONS ON THE LEVEL OF SS7 UNBUNDLING THAT IS TECHNICALLY FEASIBLE?**

A. Yes. GTE's ability to provide elements of the SS7 network on an unbundled basis is necessarily limited by the way the SS7 network is designed. Unbundling GTE's SS7 signaling network suggests that SLs, STPs, and/or SCPs within the GTE signaling

network could be purchased and/or provisioned independent of each other. This implies, for example, that SLs could be provisioned independently, and by multiple providers, without regard to purchase, or ownership, of the signaling node to which it connects. Similarly, this implies that a signaling node could be provided independent of other nodes and the links between them.

However, it is generally not possible to unbundle SLs, STPs and/or SCPs because it is not possible for ALECs to self provision, either singly or in combination, SLs, STPs, and/or SCPs within the GTE *signaling* network.

**Q. PLEASE EXPLAIN IN MORE DETAIL WHY SIGNALING LINKS CAN'T BE UNBUNDLED.**

A. It is not possible for an ALEC to self-provision a signal link for routing its own signaling messages within the GTE *signaling* network. As described earlier, signaling links within the GTE network connect signaling nodes (e.g., SSP, STP and SCP) to one another. Current industry standards, in the interest of maintaining an efficient network structure, give various elements of the network specific functions which are not resident in others. These standards do not support the unbundling of the signaling link connecting a GTE SSP or SCP to its primary GTE STP pair as neither the SSP nor the SCP can perform appropriate screening, routing or translation functions necessary to separately distinguish

and route messages to multiple links. Each GTE SSP and SCP relies upon the STPs to perform these functions and properly route messages throughout the GTE signaling network and on to interconnected signaling networks.

Similarly, it is not possible to allow a third party to provide the signal link between an SCP and its primary STP pair. As described earlier, the SCP is not capable of providing various screening and routing functions necessary to distinguish links of multiple providers and must rely upon its primary STP pair for these functions. Therefore, the signaling links must be provided between the STP pair and the SCP.

**Q. WHY ISN'T IT POSSIBLE TO UNBUNDLE SCPs?**

A. As discussed above, the SCP cannot perform screening and routing functions necessary to distinguish links and/or STPs of multiple providers. The SCP relies upon its primary STP pair for this capability. Under current standards and within GTE's network the SCP must therefore be provided in conjunction with an associated link and primary STP pair--the SCP cannot be unbundled and independently provided. Thus, access to the SCP is gained through the primary STP pair and the associated links.

**Q. WHY CAN'T STPs BE UNBUNDLED?**

A. It is not possible to provide STPs on an unbundled basis because

the STP pair was designed to be the point of interconnection to SS7 networks. Access at other points of the SS7 network is not technically feasible. Only the STP directs message flow and provides necessary network mediation functions. These functions are not performed at other points in the GTE SS7 network.

**Q. IS IT EVER FEASIBLE FOR AN ALEC TO SELF-PROVISION THE SS7 COMPONENTS?**

A. In some situations it is feasible for an ALEC to self-provision these components and interconnect to the GTE signaling network, creating a "network of networks." This can be accomplished in a variety of ways, depending upon the ALEC's choice of network elements and providers. There are two options for interconnection of an ALEC SS7 capable switch with the GTE signaling network. The first option is for an ALEC SS7 capable switch (SSP) to connect directly to a GTE STP pair. The GTE STP pair would then provide all of the screening, routing and translation functions for the ALEC SSP, just as it does today for GTE's SSPs. The second option is for an ALEC SSP to connect to an ALEC STP pair or to a STP pair provided by a third party. The ALEC or the third party STP pair would then establish an interconnection with the GTE network at an appropriate STP pair. These interconnections would be accomplished by interconnecting the two signaling nodes via SLs. The signaling link could be provisioned in a variety of ways, including: self-provisioned by the

ALEC via collocation; purchased from GTE as special access lines (SALs); provisioned over jointly constructed facilities; or provisioned in other methods that may be identified as local interconnections are discussed and negotiated.

**Q. IS IT POSSIBLE TO SAFEGUARD THE INTEGRITY OF THE SS7 NETWORK IF OTHERS INTERCONNECT WITH THAT NETWORK?**

A. In an interconnected environment, the security of the SS7 network can be assured only through mediation. Mediation refers to a number of functions. In this discussion, mediation refers to the STP functions of gateway screening. (AIN mediation, another aspect of mediation, is discussed in the testimony of GTE witness DellAngelo.) Mediation may also refer to intermediate interface with other network elements to address security and reliability issues. The gateway screening functions of the STP include screening to prevent passage of inexecutable or dangerous messages to the SCP, rejecting inconsistent messages and preventing unauthorized access to proprietary information. Neither the SCP nor any other point in the SS7 network can perform these functions. Also, access to the SCP or its associated database(s) is technically feasible only through the STP pair associated with that SCP, whether the SCP is owned by the incumbent LEC or another entity. Therefore, the SCP cannot be unbundled from the associated STPs.

**Q. FOR WHAT PURPOSES DOES GTE PROVIDE STP INTERCONNECTION?**

A. GTE provides STP interconnection for call setup, access to the 800 data base and access to GTE's LIDB. STP interconnection for call setup and for DB800 queries takes place at the local STP pairs serving the LATA or LATAs in which the message is originated. DB800 queries are directed to the DB800 database from an appropriately-equipped end office or access tandem in the local exchange network to determine the appropriate carrier for routing an 800/888 dialed call. All switches which are equipped to perform this function (i.e., SSP functionality) must have access to a DB800 database. Offices which are not equipped to perform this function must route all 800/888 dialed calls to a switch which can perform this function. Interconnection for access to GTE's line information database (LIDB) takes place through the regional STP pair associated with the SCP and LIDB database in Indiana (local STPs in the network are connected to regional STP pair). Queries are directed and processed according to industry standards for calling card verification, third-party and reverse billing of operator-assisted calls.

**Q. WILL INTERCONNECTION ONLY AT THE STP PAIR HARM THE ALECS' ABILITY TO COMPETE?**

A. No. Interconnection at the STP pair will provide ALECs with the

ability to establish service and compete in the local service arena, since ALECs can obtain access to all SS7 functions at the STP pair. With interconnection at the STP, ALECs will also have access to all GTE databases needed for call routing and completion. Failure to obtain access to GTE's SS7 network at other points will not impair the ALEC's ability to provide their subscribers with any SS7 service equivalent to that offered by GTE today to GTE's subscribers.

**Q. ASIDE FROM ANY TECHNICAL CONSIDERATIONS, ARE THERE POLICY REASONS RECOMMENDING AGAINST INTERCONNECTION AT POINTS OTHER THAN THE STP PAIR?**

A. Yes. Setting aside that technical standards do not presently exist for interconnection at points other than the STP pair and that no standards have been established and accepted for direct interconnection into the SCP, if direct interconnection at the SCP were accomplished the consequences could be extreme and wide-ranging. Even if a resourceful engineer were able to modify the hardware and logic of an SCP to accomplish such an interconnection, several undesirable events are possible, depending on the quality of the design and software development:

- Customer proprietary network information (CPNI) contained in the SCP could be compromised thereby resulting in improper disclosure and/or modification of

private customer information by unauthorized persons, entities or "hackers." Access to such information could not be prevented, controlled or managed as it is with STP mediation.

- Other interconnected SS7 networks might not be able to appropriately route messages to the correct destination.

- Without mediation by the STP, the SCP would not be capable of distinguishing potentially conflicting instructions for the same customer, originating from two different networks.

- Maintenance, operational and administrative messages from the interconnecting SS7 network could affect the network of the owner of the SCP and potentially, some or all of the SS7 networks interconnected with the SS7 network of the SCP owner.

If any of the above-referenced events were to happen, customer service would be affected, ranging from minor impact (e.g., routing of calls to the wrong destination) to catastrophic (e.g., isolating a number of switching offices, or disabling portions of an SS7 network).

**Q. ARE THE CONCERNS YOU RAISE ABOUT BROAD SS7 UNBUNDLING AND INTERCONNECTION UNIQUE TO GTE'S SIGNALING NETWORK?**

A. No. The GTE signaling network is designed to conform with *current industry standards.* The types of screening, routing and translation capabilities needed to provide for third party access to individual network nodes, i.e., SSPs and SCPs, are not supported by current standards.

**Q. HOW, SPECIFICALLY, DOES GTE PROPOSE TO ALLOW INTERCONNECTION THROUGH THE STP TO ITS SS7 NETWORK?**

A. GTE would offer a number of interconnection options through the STP. These options, listed below, are a function of the technological and network reasons discussed above.

| Component | Options |
|---|---|
| SIs to the STP | • SLs may be self provisioned by the ALEC via collocation; or<br>• SLs may be purchased from GTE as special access lines; or<br>• SLs may be provisioned over jointly constructed facilities; or<br>• SLs may be established by other methods which are identified as |

| | | |
|---|---|---|
| | | local interconnections are discussed and negotiated. |
| STP Port | • | Access to GTE's SS7 system is provisioned only through the STP Port according to GTOC1. |
| Database queries | • | Requires STP port interconnection. |
| | • | LIDB queries provisioned under terms and conditions reflected in GTOC1, GTE's Federal access tariff. |
| | • | DB800 queries provisioned under the terms and conditions reflected in GTE's Carrier Selection Service, which is offered to all LECs. |
| | • | Provisioning of other database queries will be established as such databases are developed. |

These options are diagrammed in Exhibit No. DNM-5.

**Q. HOW WOULD PRICING FOR ALEC INTERCONNECTION TO GTE'S SS7 NETWORK BE DETERMINED?**

A. Pricing for ALEC interconnection to GTE's signaling SS7 signaling

network will be as follows:

| Component | Options |
|---|---|
| Links to STP: | • Pricing for the individual link "pieces" negotiated for the interconnection will be at the state tariffed rate for these "pieces" (e.g., collocation, special access facilities, etc.); or<br>• If the ALEC wishes GTE to provide the signaling link to GTE's STP pair(s), GTE will provide Dedicated Switched Access Line (DSAL) and Dedicated Switched Access Termination (DSAT) facilities from the Customer Designated Location (CDL), with pricing from GTOC1, GTE's Federal access tariff. |
| STP Ports: | • The pricing for STP Ports will be the STP Port rate referenced in GTOC1, GTE's Federal access tariff. |
| Databases: | • Pricing for database queries will be either: (1) from GTOC1, GTE's |

Federal access tariff (in the case of LIDB); or (2) at the current pricing for GTE's services offered to other LECs (in the case of DB800/Carrier Selection Service).

**Q. WHY HAS GTE PROPOSED SEVERAL DIFFERENT ARRANGEMENTS FOR SS7 INTERCONNECTION?**

A. GTE proposes the above-referenced arrangements for SS7 network interconnection instead of an all-inclusive tariff arrangement, since SS7 network interconnections are complex and not reducible to a single element. A "one-size-fits-all" approach is not well-suited for establishing SS7 interconnection. Contractual arrangements in regard to interconnection of the link between the ALECs to a GTE STP can be established at the time of negotiation of an overall interconnection agreement. Depending upon the manner in which the ALECs are linked, certain GTE tariffs will apply. GTE believes that this manner of establishing interconnection will provide the most efficient, most effective, and lowest cost solution for the ALEC.

**Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

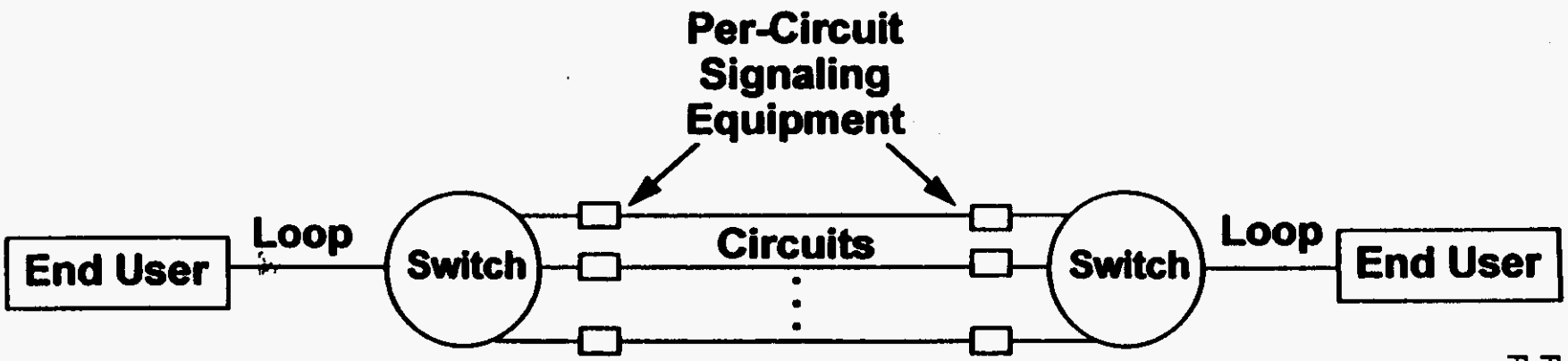
A. GTE's SS7 network cannot be unbundled at this time to permit physical interconnection at any point other than the STP, which fulfills a vital role in safeguarding network reliability and integrity.

Access at the STP pair will enable the ALECs to obtain access to any SS7 service equivalent to that offered by GTE today. GTE will charge its federally tariffed prices for interconnection into the SS7 network except where contractual negotiation is better suited to meet the needs of the ALECs in regard to the provision of particular interconnection links to the STP. Where negotiation results in provision of facilities covered by state tariffs, the state tariff rate or rates will be applicable.

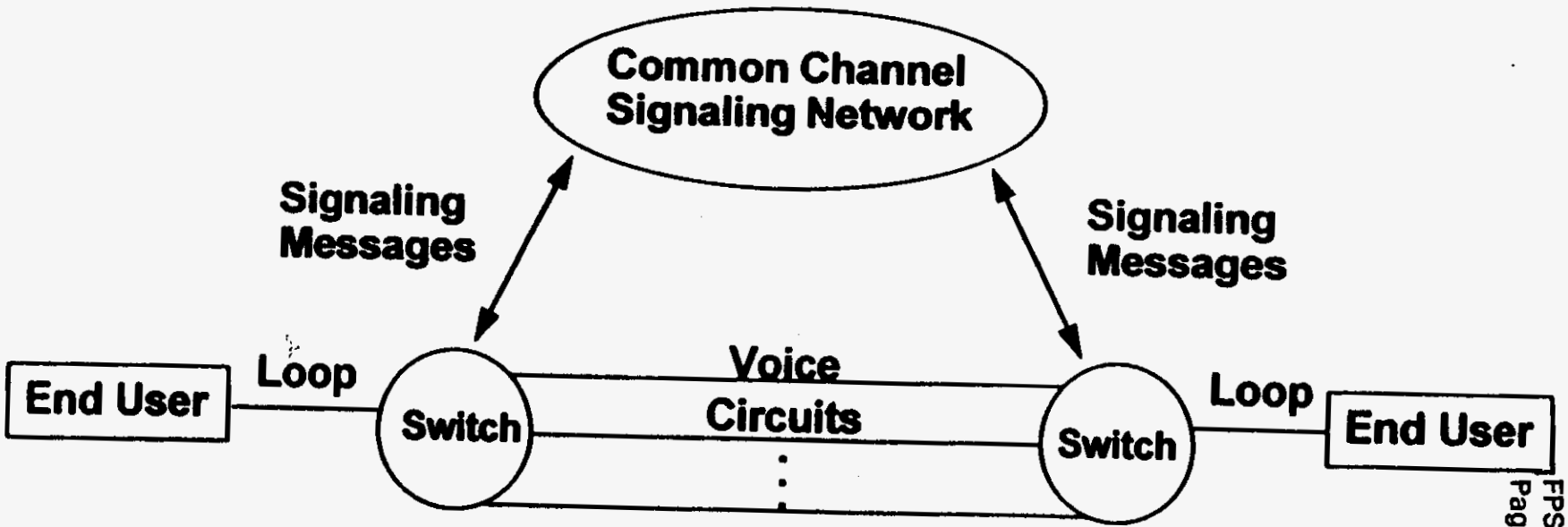
**Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

A. Yes, it does.

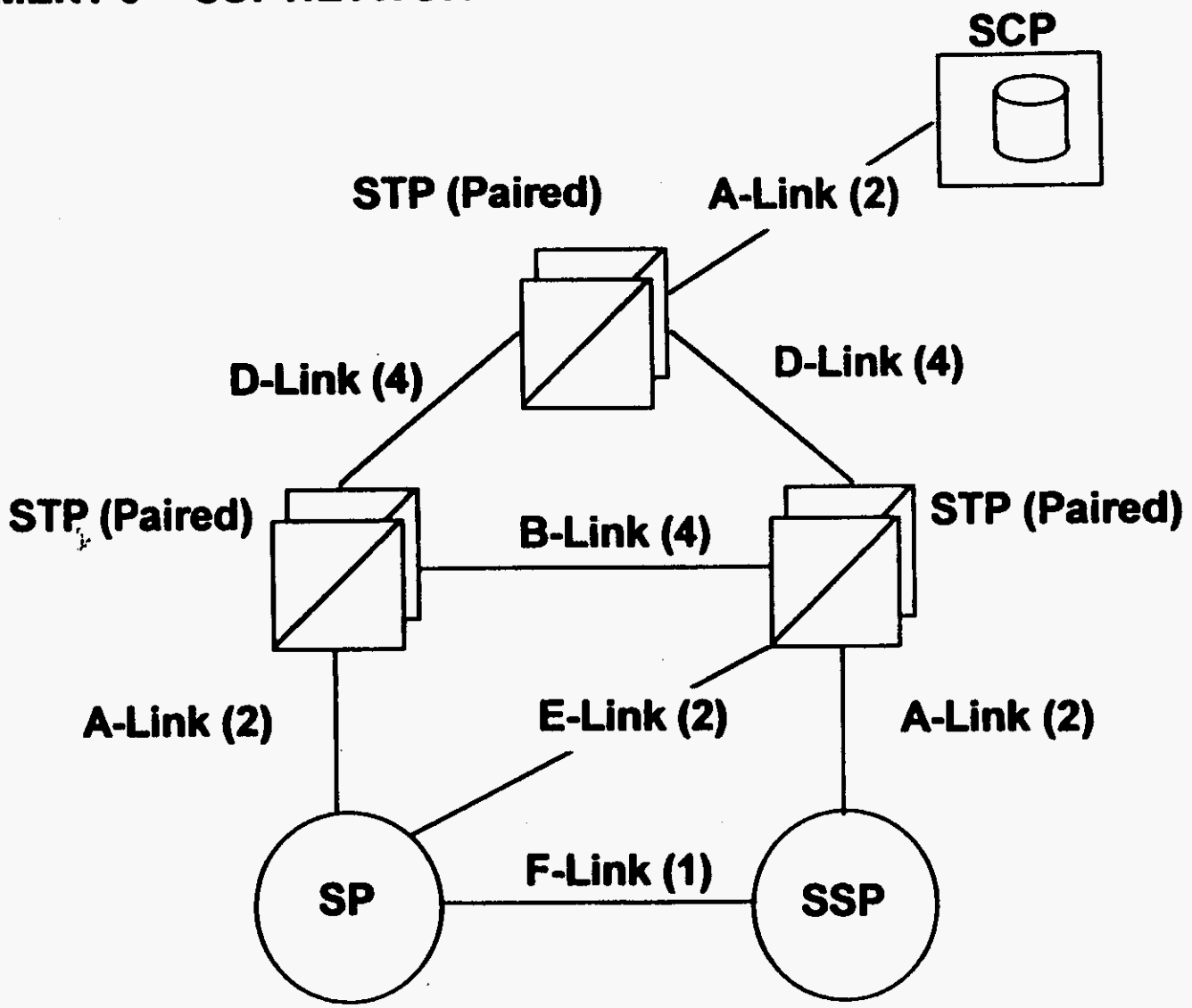
## ATTACHMENT 1 -- TRADITIONAL SIGNALING



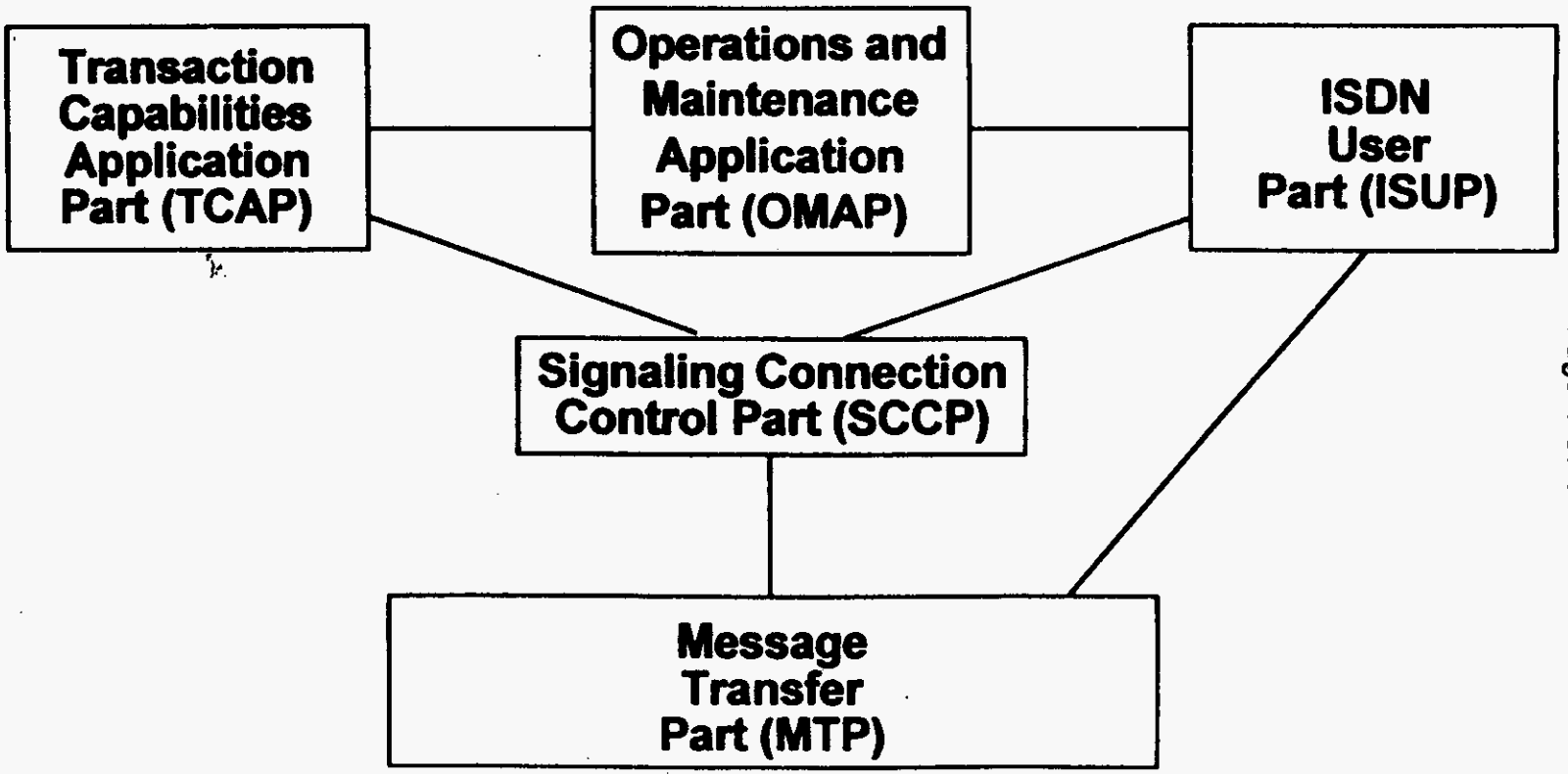
# ATTACHMENT 2 -- COMMON CHANNEL SIGNALING



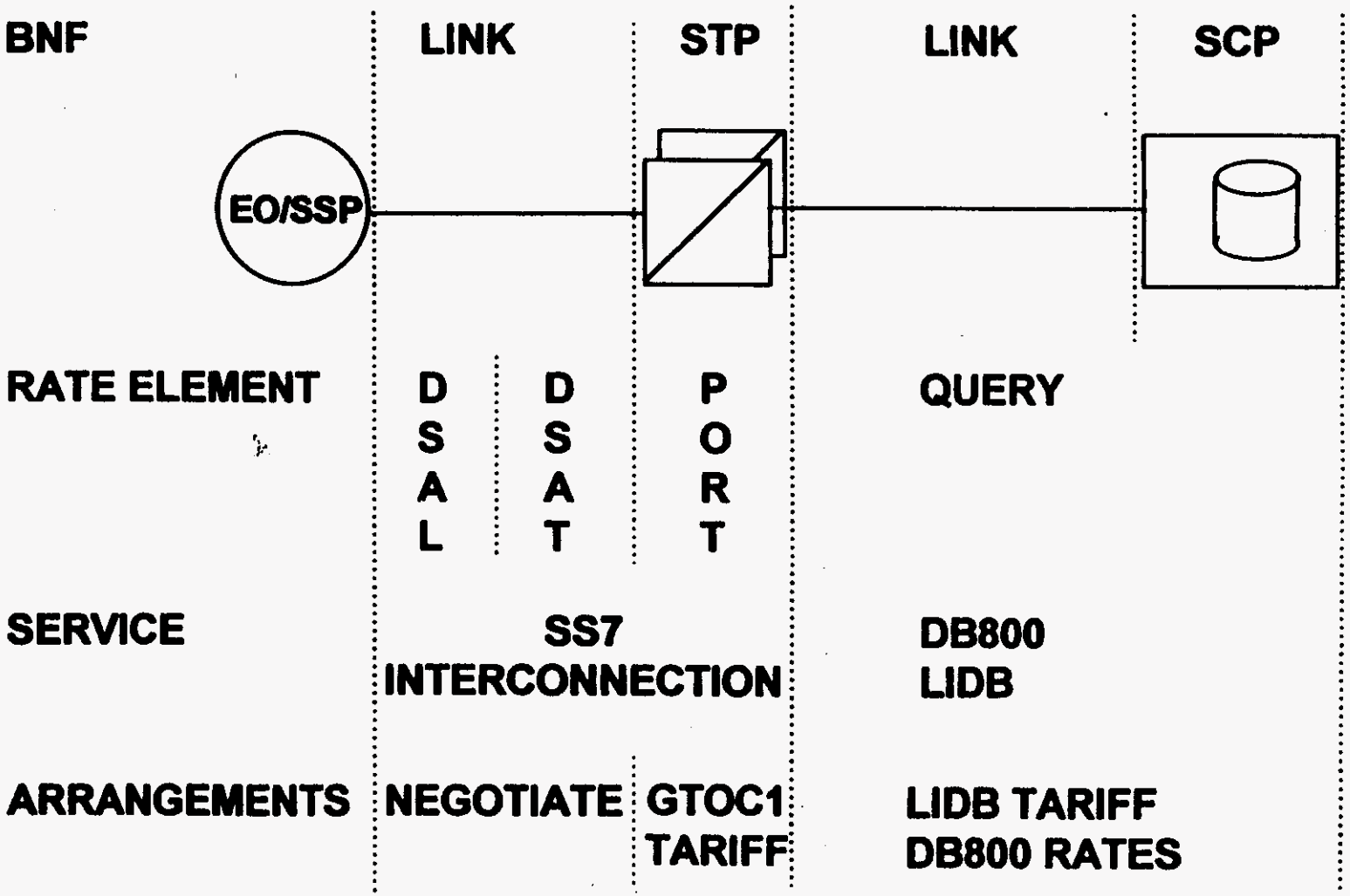
## ATTACHMENT 3 -- SS7 NETWORK ARCHITECTURE



## ATTACHMENT 4 -- SS7 PROTOCOL STRUCTURE



# ATTACHMENT 5 -- LOCAL INTERCONNECTION STRUCTURE



**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF MICHAEL L. DELLANGELO**

**DOCKET NO. 960847-TP**

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

A. My name is Michael L. DellAngelo. My business address is 600 Hidden Ridge, Irving, TX, 75038.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations (GTE) as Program Manager in the Advanced Intelligent Network (AIN) Program Management Group. I provide direction and technical support for all apects of AIN implementation within GTE's public switched network. I investigate technical infrastructure requirements necessary to deliver new services via the AIN.

**Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATION AND WORK EXPERIENCE.**

A. I have a Bachelor of Science degree in Electrical Engineering from Michigan Technological University located in Houghton, Michigan. I have been employed with GTE for 25 years in a variety of technical and managerial positions. My previous experiences have included: central office equipment engineering; engineering and cutover of analog and digital stored program control

switching offices; technical standards and support; outside plant/facilities engineering and construction; capital budgeting; Open Network Architecture (ONA); and business case planning for new feature developments on switching systems. For the past four years I have been involved in all aspects of GTE's planning efforts to support the deployment of an AIN network infrastructure. During the past year, I have represented GTE in preparing the Intelligent Network (IN) Industry Project which was presented to the Federal Communications Commission (FCC) as a telecommunications industry effort to objectively address the unbundling of AIN functions.

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

A. The purpose of my testimony is to address AT&T's request that GTE unbundle Advanced Intelligent Network ("AIN"). I will describe what AIN is, identify relevant portions of the Act, identify the disputed issues relevant to AIN, and explain GTE's position relevant to each issue.

**Q. PLEASE PROVIDE AN OVERVIEW OF THE AIN ISSUES THAT WILL BE ADDRESSED IN YOUR TESTIMONY.**

A. The Telecommunications Act of 1996 (the "Act") requires incumbent local exchange carriers ("ILECs") to provide, on an unbundled basis, nondiscriminatory access to network elements at any technically feasible point. In its First Report and Order, the

FCC interpreted the Act's unbundling provisions to require ILECs to make their Advanced Intelligent Network ("AIN") Service Control Point ("SCP" or "database") available to competitors either through the sale of local switching services or, if adequate safeguards exist, through interconnection of the competitor's local switch to the ILEC's Signaling Transfer Points ("STPs"). The Act also requires that ALECs have access to ILECs' Service Management System ("SMS") and Service Creation Environment ("SCE"). GTE is currently identifying what steps are necessary and how much it will cost to modify its network to comply with the FCC's Order so that AT&T and other telecommunications service providers can offer the same AIN services being offered by GTE.

In addition to the access ordered by the FCC, AT&T makes two requests, neither of which for GTE is technically feasible: (1) AT&T seeks access to all available AIN Trigger Detection Points ("TDPs") in ILEC end office switches, and (2) AT&T wants to interconnect its network with GTE's Signaling System 7 ("SS7") network in order to exchange AIN messages between GTE's end offices and AT&T's AIN SCP. However, end office switches were not designed to support the direct (i.e., unmediated) access AT&T seeks. Such direct access could severely harm the reliability and security of the public-switched network system, other telecommunications service provider networks and end-

users. In addition, direct access by AT&T raises significant operational concerns. In an effort to resolve these problems, GTE has been actively participating in the "LEC Proposal for an Industry IN Project," which seeks to identify and resolve the technical and operational issues associated with unbundling AIN. Until a resolution is possible, however, AT&T's requests for direct access are not technically feasible.

**Q. HOW IS THE REMAINDER OF YOUR TESTIMONY ORGANIZED?**

A. Section A describes AIN. Section B sets forth the relevant provisions of the Act. Section C provides a list of the issues to be arbitrated, accompanied by a summary of each party's position. Finally, Section D explains GTE's position on the unbundling of AIN in detail.

## SECTION A: DESCRIPTION OF AIN

**Q. WHAT IS AIN?**

A. AIN allows the development of new services on a centralized basis. However, in order to properly understand AIN, it is important to recognize how it differs from the SS7 network (which is described in the Direct Testimony of Douglas N. Morris) and traditional Intelligent Network ("IN") applications. These differences highlight why direct access to AIN poses unique risks

that are not inherent in granting access to SS7 networks and IN applications.

**Q. PLEASE DESCRIBE SS7 AND TRADITIONAL "IN" APPLICATIONS.**

A. Current generation network switching systems are controlled by an internal, special purpose computing environment designed to facilitate call processing. All call processing programs and associated line, trunk, and customer data are stored internally within this computing environment. As explained below, these systems are not designed to protect against the actions of one service provider from affecting other service providers' networks.

With the advent of new services, such as Database 800 ("DB800"), Calling Name Delivery ("CNAM"), and Calling Card Validation ("CCV") for Alternate Billing Systems ("Operator Services"), all of which require the storage and retrieval of millions of records, it is not technically feasible to store this information in every switching system supporting the application. The technical solution developed to manage the millions of records associated with these new applications consists of centralized network databases, each of which is accessed by switches using special internal call processing logic. The switching systems equipped with the special internal call processing logic are called Service Switching Points ("SSPs"). The centralized network databases are called Service Control

Points ("SCPs"). Data is loaded into the SCP through the Service Management System ("SMS").

In its simplest form, signaling messages are sent via SS7 network links, traveling from the SSP through one or more Signaling Transfer Points ("STPs") (or intersections) before reaching their final destination, the SCP. As shown in Exhibit No. MLD-1, when a call reaches the SSP, the SSP's internal call processing logic identifies whether access to a centralized SCP (or database) is required. If so, the SSP suspends the call while it queries the SCP for further instructions. Using the SS7 network, the SSP releases a packet (or envelope) which is addressed with routing information (known as Signaling Connection Control Part "SCCP") coded to direct the packet through the appropriate STPs and eventually to the SCP. In addition to the routing codes, the packet contains a message in the form of unique signaling codes called Transaction Capabilities Applications Part ("TCAP"). The TCAP is necessary to query the SCP, which responds by sending a TCAP message back to the originating SSP, where the call is being held.

This intelligent network architecture has been implemented universally within the United States for DB800, CNAM, and CCV applications. As the following examples demonstrate, safeguards designed to protect the integrity of the network can be

programmed into the SSP and SCP because, for each IN application, the message structure and parameters are predefined and locked-in. This ability to predefine responses at both ends of the IN message path is not technically feasible with AIN. In fact, as explained below, AIN's advantages derive from the fact that the query and response parameters are not predefined, allowing multiple services to be provided from a generic database.

For example, DB800 is an application that uses the IN architecture. When a switch equipped with 800 SSP call processing logic receives an 800 dialed call (including expanded toll-free calling, 888, etc.), the switch suspends call processing and launches an 800 TCAP query message to the 800 SCP (or database) to obtain call routing information. The 800 SCP searches for the record associated with the dialed 800 number and returns a response TCAP message containing the appropriate routing information. The only routing information that can be returned is the interexchange carrier ("IXC") code assigned to the 800 number dialed or a plain old telephone service ("POTS") number associated with the 800 number. The SCP or SSP also will create 800 application-specific Automatic Message Accounting ("AMA") records for proper 800 service billing.

CNAM is an example of another IN application. When a call is terminated to a line equipped with CNAM service, the SSP will

launch a query to the CNAM database to retrieve the name of the calling party. The SSP sends a CNAM-specific TCAP query message containing the Calling Party Number. The CNAM database retrieves the Calling Name associated with the Calling Party Number received at the SSP. The only function performed by the CNAM IN application is the delivery of a Calling Name if available in the CNAM database. The operation of all normal switch-based features and AMA billing will function as if the IN application had not been encountered.

CCV is an IN application that supports Operator Services Systems ("OSS") for alternate billed calls. The key function of this application is to validate Calling Card Numbers entered by the caller. After the OSS has collected the Calling Card Number, a query is launched to a Line Information Database ("LIDB") to determine if the Calling Card Number is valid. The results of this validation will determine only if the call is authorized to be completed.

Each of the three applications described above is based upon a unique set of industry standards defined by the American National Standards Institute ("ANSI") SS7 network standards and Bellcore-developed Technical Requirements. IN applications require application-specific logic (computer software or programs) resident in the serving SSP. All message structures and

parameters are specifically defined and hard-coded into both the SCP and SSP for each application. Thus, the application cannot dynamically route to any destination, and the messages between the SSP and the SCP are locked-in so that any party accessing the SCP will get a predefined response over which it cannot exercise control. Also, and particularly relevant to understanding how AIN is different, SS7 network signaling and IN applications cannot modify, add, or delete parameters such as Calling Party Number and Calling Party Number Privacy indicators, or impact switch billing AMA information.

**Q. PLEASE DESCRIBE AIN AND HOW IT DIFFERS FROM IN.**

A. AIN was introduced in the late 1980s and, unlike IN, is designed to allow a variety of services to be provided from a centralized AIN SCP. Although AIN applications send messages through the same SS7 network and, thus, flow in much the same way as IN applications, there are some fundamental differences. Unlike IN, AIN defines trigger detection points (or "TDPs") within the SSP. If a call triggers a TDP, call processing is suspended while the SSP queries the AIN SCP. As with IN applications, the TCAP query is contained in an information packet and routed using the SS7 network, traveling through the appropriate STPs and eventually to the AIN SCP. However, instead of going to a unique SCP database containing predefined responses (e.g., DB800, CNAM, or CCV), the AIN SCP has generic capabilities

that allow it to facilitate the provision of many different services. Unlike the predefined messages and responses triggered by IN applications, the TCAP returned by the AIN SCP can override normal SSP switch functions, add, delete, and modify call processing information, and create unique AMA billing records, thereby giving the AIN SCP complete control of the internal switch call processing environment and potentially affecting the entire network. Thus, with AIN, extreme care must be taken to assure that AIN services do not adversely impact other end-user switch-based services or required AMA billing record generation.

## SECTION B: AIN AND THE TELECOMMUNICATIONS ACT OF 1996

**Q. PLEASE PROVIDE HOW THE ACT ADDRESSES AIN.**

A. The Act provides that each incumbent local exchange carrier ("ILEC") has the following duties:

> UNBUNDLED ACCESS. -- The duty to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point. . .

47 U.S.C. § 251(c)(3) (1996). The Act further provides that,

> [i]n determining what network elements should be made available for purposes of subsection (c)(3), the [FCC] shall consider, at a minimum, whether --
>
> (A) access to such network elements as are proprietary in nature is necessary; and
>
> (B) the failure to provide access to such network elements would impair the ability of the telecommunications carrier seeking access to provide the services that it seeks to offer.

47 U.S.C. § 251(d)(2) (1996).

The FCC has interpreted these provisions to require ILECs to provide access to AIN in three ways:

(1) by purchasing local switching services from the ILEC;

(2) if the competing carrier deploys its own local SSP or STP, by connecting to the ILEC's STP provided there is adequate mediation; or

(3) by connecting to the SMS, provided there is adequate mediation.

See In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket No. 96-98, FCC 96-325 (released Aug. 8, 1996) (the

"Order") ¶¶ 486, 487-88 and 493. The ILEC is not required to connect third party call-related SCPs (or databases) to the ILEC's signaling system. Id. ¶ 501.

## SECTION C: UNRESOLVED ISSUES BETWEEN GTE AND AT&T

**Q. WHAT ARE THE ISSUES TO BE ARBITRATED IN THIS PROCEEDING?**

A. The issues presented in this arbitration flow predominately from the parties' differing views of the purposes and requirements of the Act. The issues about which the parties disagree are as follows:

(1) *Is direct access to AIN TDPs technically feasible?*

**AT&T's Position:** Unbundled access to AIN is technically feasible at all AIN TDPs.

**GTE's Position:** Direct access to AIN TDPs is not technically feasible and, therefore, not required under the Act. Because TDPs reside in SSPs, the TDPs are not equipped to handle multiple users and are not capable of being partitioned for use by different service providers. Access could harm the network system, other telecommunications service providers and end-users.

(2) *Is GTE required to accept at its STP signaling messages from AT&T's AIN SCP?*

**AT&T's Position:** Interconnecting AT&T's AIN SCP to GTE's STP is technically feasible. Just as carriers are certified for interconnection, they can be certified for AIN interconnection.

**GTE's Position:** Permitting AT&T and other third parties to interconnect foreign AIN SCPs to GTE's STP is not technically feasible and would result in harm to the network, other telecommunications service providers and end-users.

## SECTION D: GTE'S POSITION

**Q. WHAT IS GTE'S GENERAL POSITION CONCERNING THE DISPUTED ISSUES?**

A. In its Order, the FCC concluded that unbundling is "technically feasible" if access to network elements can be achieved without significant technical or operational concerns, whether or not modifications to the ILEC's facilities are necessary. Id. ¶ 198. Thus, GTE is required by the Order to modify its network to

comply with the Order. This will allow AT&T to offer the same AIN services offered by GTE.

AT&T's requests, however, go beyond the unbundling required by the Order. AT&T requests direct (i.e., unmediated) access to all available end office AIN TDPs, which are located in the SSP, and wants to interconnect its AIN SCP to GTE's SS7 network for the purpose of exchanging AIN TCAP messages. In defining "technically feasible," however, the FCC explicitly excluded access to network elements that would negatively affect network reliability and security:

> [L]egitimate threats to network reliability and security must be considered. . . . Negative network reliability effects are necessarily contrary to a finding of technical feasibility. Each carrier must be able to retain responsibility for the management, control, and performance of its own network.

Order, ¶ 198.

Direct access to AIN, as requested by AT&T, would threaten network reliability and security. Specific examples of the types of harm that would occur are described below. In addition, direct access to AIN raises significant operational concerns. Therefore, until it is possible to deploy adequate safeguards to protect against the threats to network reliability and security and the

operational concerns are resolved, direct access to AIN is not technically feasible.

**Q. SHOULD DIRECT ACCESS TO TDPs BE ALLOWED?**

A. No. Direct access to TDPs is not technically feasible. AT&T has attempted to obfuscate through oversimplification the serious harm to network reliability and security that could result if, without adequate mediation, AT&T is given direct access to TDPs. In addition, direct access raises significant operational concerns. AT&T, on other hand, contends that direct access to TDPs is technically feasible, and no different from the type of access currently available for IN applications and SS7 networks.

**Q. WHY IS ADEQUATE MEDIATION CRITICAL?**

A. As explained above, there is a fundamental difference between traditional IN applications and AIN. Unlike IN applications, which are service specific, AIN introduces generic capabilities that can be used to provide many different services. AIN introduces a set of functional capabilities that allow an AIN SCP to control internal switch call processing functions. This robust set of capabilities allows the AIN SCP to control routing functions and call processing information which can have a detrimental impact on all AIN subscribers, switch-based end-users' services and normal AMA billing record generation. Thus, adequate mediation must

be deployed to ensure that the TCAP message does not corrupt the SSP or the network.

Mediation is the generic term used to describe safeguards that allow multiple third-party access to an existing closed operating system. Mediation represents a set of real-time and procedural functions to facilitate secure, cost-effective and network-efficient third-party access to an existing AIN. The key functions to be managed and controlled by mediation include: privacy, security, routing, billing, screening, feature interactions, operational procedures, reliability, provisioning, performance monitoring, error handling, customer care, network management, and interconnection testing.

In the absence of adequate mediation, there are numerous scenarios that could arise in regard to call processing.

**Q. COULD YOU DESCRIBE IN MORE DETAIL THE HARMS ARISING FROM INADEQUATE MEDIATION?**

A. Potential consequences of third-party access without adequate mediation include:

- Third parties can change the Billing Number forwarded to an IXC on a real time call-by-call basis. Incorrect billing

numbers will result in IXCs being unable to bill for calls or billing calls to the wrong customer.

- Third parties can change the Carrier Identification Code on a real time call-by-call basis. This will override an end user's presubscribed carrier or 10XXX dialed carrier codes. This capability allows practices known as "slamming" to occur on a real time call-by-call basis.

- Third parties can change the Calling Party Number of the originator. This will negatively impact terminating type services which utilize the Calling Party Number such as the customer local area signaling services ("CLASS") selective call services, Calling Number Delivery, Calling Name Delivery, and Automatic Recall.

- Third parties can change the Privacy Indicator of the Calling Party's Number. A Calling Party that may have dialed the *67 privacy code to make their number private can have that number changed to "Public" by a third party.

- An AIN generic capability allows an AIN SCP to Activate and Deactivate AIN triggers on a real time basis. A third party can control any AIN trigger assigned in the office independent of the AIN service provider. In other words,

one AIN service provider can activate or deactivate triggers that are assigned to another AIN service provider. Any AIN provider has full access to all AIN triggers in the switch.

- All IN applications and AIN provide an overload control mechanism known as Automatic Call or Code Gapping ("ACG"). The purpose of ACG is to allow an SCP that encounters an overload condition to request the SSP to limit the number of queries it sends to the SCP while in overload condition. ACG controls are activated on an application level. An ACG control activated by a DB800 IN application will only impact 800 dialed calls. From an AIN 0.1 ACG perspective, AIN call processing is considered a separate application. If a third party's SCP were to encounter an overload condition and activate ACG controls, the controls are applied to all AIN services for all AIN service providers. AIN calls encountering ACG controls will be routed to final treatment and not completed. Controls must be implemented which prevent one AIN service provider's platform from affecting all other AIN service provider's services. These controls are considered a part of mediation.

- AIN AMA record generation is under the total control of an AIN SCP. If a third party's SCP provides erroneous billing

information or does not deliver expected billing information, GTE, IXCs, or potentially other providers may not be able to bill correctly for their services.

- AIN call processing capabilities allow an AIN service to request the serving switch to play announcements or play announcements and collect digits. These AIN announcements are specially recorded for AIN services and are accessed by AIN services via Announcement ID numbers. There are no industry standards which define the message content for AIN announcements or the ID assigned to the announcement. Without an industry standard, third parties will face significant interconnection and implementation issues across multiple LEC networks.

- There are specific AIN trigger precedence rules over switch based functions. Depending upon the trigger activated, the subscriber may not be able to call emergency 911 service.

Allowing direct access to AIN without adequate mediation could result in serious harm to the reliability and security of the network. Thus, until adequate mediation is available, direct access is not technically feasible.

**Q. IS ADEQUATE MEDIATION CURRENTLY FEASIBLE?**

A. No. AT&T states that existing AIN standards already contain adequate safeguards, and that additional mediation will only result in unacceptable costs and delays. However, there are no existing standards or mediation functions performed in the network TDPs.

Effective mediation would require that the switch be partitioned, a feat that is not easily accomplished, or provided by external mediation platforms. The internal computing environment of a switching system was not designed to support a multi-user environment. Because TDPs are contained within the switch, they too cannot support a multi-user environment without mediation. Unlike IN applications, which have been hard-coded to allow only a specific operation to occur, AIN does not provide for these safeguards. AIN will allow operations under control of the AIN SCP to occur that can negatively affect call processing and end-user service operation.

Because AIN standards are relatively new and have not been developed and implemented industry-wide, it is not technically feasible to provide direct access to TDPs. The first industry standards defining AIN functional requirements were issued by Bellcore Technical Requirements documents released in August 1992, and titled as AIN 0.1 requirements. The implementation of these requirements by major switch vendors began incrementally through a phased approach beginning in 1994. No switch

vendor, however, supports all of these requirements. In many cases, switch vendors are only now beginning to deliver many of these required functions. As a result, there are many undesirable interactions and incompatibilities between switch-based features and new AIN services.

In addition to addressing these call processing issues, business processes between GTE and a third-party AIN service provider must be defined. This requires new interfaces and mediation functions on GTE's operational support systems to support the day-to-day business processes for ordering, provisioning, security, billing, and trouble resolution. Adequate processes and systems to manage these interactions are not yet available, creating significant administrative and market issues for GTE. These issues become even more complex when third-party access is considered.

**Q. DOES ACCESS TO IN APPLICATIONS MEAN THAT ACCESS TO AIN IS TECHNICALLY FEASIBLE?**

A. No. AT&T has concluded that because centralized databases, such as LIDB, are being used successfully by ILECs, third-party access to GTE's TDPs is technically feasible without additional mediation. This comparison to IN and AIN applications, however, fails to recognize the fundamental difference between IN applications and AIN.

Each IN application, as explained above, supports a specific service. Safeguards, which are necessary to assure that end-user services are not affected and network integrity is not jeopardized, are hard-coded into the specific logic for each application in both the SSP and SCP. In the existing AIN environment, these safeguards do not exist. Just because the IN LIDB application can be successfully mediated, it in no way supports AT&T's claim that access to AIN TDPs can occur without mediation.

AT&T also incorrectly suggests that because the proposed LRN solution for Local Number Portability ("LNP") makes full use of SS7 network protocols and will be implemented in a multi-carrier and multi-vendor environment, that AIN TDP access is feasible without any form of mediation. The LRN solution being considered by the industry requires the development of a service-specific application for LRN in the local switching office. The architecture being prepared uses a unique AIN-like PODP trigger. Although misleadingly referred to as an AIN-based solution because of the use of the PODP trigger, the LRN solution is only another IN application. The proposed LRN solution requires expanded SS7 network changes, in addition to communicating TCAP messages between the SSP and SCP. These expanded changes require that an identifier be included in the SS7 forward call indicator parameter to indicate if a LRN database query has already been completed. This prevents multiple LRN queries from

being generated for the same call. Application specific logic (computer software or program) will be hard-coded into both the SSP and new LNP SCP database. It is nothing more than an expanded DB800 IN application in which the PODP trigger is hard-coded with predefined safeguards.

**Q. DOES DIRECT ACCESS RAISE SIGNIFICANT OPERATIONAL CONCERNS?**

A. Yes. The FCC concluded that unbundling is "technically feasible" if access can be achieved without significant technical or operational concerns. Order, ¶ 198. In addition to the technical problems with AT&T's request for direct access to TDPs, AT&T's request raises significant operational concerns.

There are two distinct categories of TDPs or triggers: (1) subscribed and (2) public office dialing plan ("PODP") triggers. Subscribed triggers are assigned to specific lines or trunks, whereas PODP triggers are assigned at the office dialing plan level. Subscribed triggers are only encountered on calls that originate or terminate to the specific line or trunk equipped with the trigger. As defined by Bellcore's AIN 0.1 Technical Requirements, examples of subscribed triggers are off-hook immediate, off-hook delayed, and terminating attempt. These triggers are assigned and provisioned on individual end-users' lines, and will be encountered only when calls originate or

terminate from these provisioned lines. An assigned trigger can be routed only to one AIN SCP database. It cannot be shared by multiple providers.

PODP triggers are provisioned at the office dialing plan level of the switch translator. These triggers are encountered when any line or trunk dials the number or code assigned to the trigger. Examples of PODP triggers are the 3/6/10 digit PODP, vertical service code (*XX), and N11. Similar to a subscribed trigger, an assigned PODP trigger can be routed only to one AIN SCP database. It cannot be shared by multiple providers. Also, it is questionable whether these triggers can ever be assigned independently to third parties. The key reason is that these are shared industry numbers or codes which are not controlled by any single party.

AT&T insists that it needs access to all triggers to be competitive. However, AT&T disregards many of the issues raised by its request for access to such triggers. For example, PODP triggers can be assigned to such codes as 411, 555, and *99 vertical service codes. These number resources are very limited and their use must be closely controlled. Except for a few *XX codes, all other codes are already assigned for specific services (e.g., *67 is used for Calling Party Number privacy control). Numerous concerns in regard to assignment consequently arise, including

whether these limited numbering resources would be assigned to a very small number of AIN service providers; which AIN service providers would receive access to these limited numbering resources; and what criteria would be used to assign these codes. Assignment of a code to one AIN service provider and not another arguably could significantly disadvantage other service providers. It is easy for AT&T to demand access to these triggers. However, there are numerous other providers who would make similar demands which could not be accommodated. In short, there are significant operational concerns that must be resolved before direct access to TDPs is technically feasible.

**Q. IS FOREIGN AIN INTERCONNECTION TO GTE'S STP TECHNICALLY FEASIBLE?**

A. No. AT&T's conclusion that it is technically feasible to send messages between its AIN and GTE's STPs disregards the serious consequences associated with third-party interconnection without mediation. The issue is not whether AT&T and GTE can send and receive AIN TCAP messages between their networks. That is relatively simple. Rather, the real issue is the need to mediate the content of the TCAP message. It is the content rather than the mere transmission of the message that can corrupt the network. Although AT&T was able to interconnect an AT&T AIN 0.1 capable SCP to BellSouth's off-line laboratory SSPs, these test results demonstrate only that AIN TCAP messages can be sent

and received. The result says nothing about the real problem -- the ability to mediate content.

AT&T's proposed interconnection arrangement results in SSP queries being routed directly to the foreign AIN SCP via SS7 network links, traveling through GTE's STPs. Current STP gateway screening, however, only mediates routing codes (the SCCP); it does not provide any mediation of the contents of AIN TCAP messages. Thus, STP gateway screening will not control against the threat of harm to the reliability or security of the network, other system providers' networks or end users.

Specific criteria and rules must be established before an interconnection arrangement can be considered technically feasible. In the case of AIN, interconnection criteria must assure that the integrity of the network is not compromised. Because foreign AIN interconnection would negatively affect the reliability and security of the public switched network and service to the end-user, the arrangement is not technically feasible.

**Q. ARE THERE INDUSTRY EFFORTS UNDERWAY TO DEVELOP STANDARDS NECESSARY TO UNBUNDLE AIN?**

A. Yes. The near-term solution, which can be implemented immediately, would allow an ALEC to purchase existing GTE AIN service or work jointly with GTE to create and deploy ALEC

specific AIN services that operate on GTE's AIN databases. This is essentially what the FCC ordered. This approach allows an ALEC to enter the market immediately and avoids the problems inherent with multiple platform/multiple provider mediation requirements. With this implementation, the ALEC can gain access to GTE's underlying AIN capabilities without direct access to AIN triggers.

With respect to the long-term solution, unbundling must be provided pursuant to uniform technical standards. Thus, GTE has been an active participant in the FCC Docket related to AIN unbundling, FCC Docket 91-346, and the LEC proposal for an industry project to define uniform technical standards and open interfaces for AIN trigger access.

FCC Docket 91-346, In the Matter of Intelligent Networks, was initiated to unbundle access to ILEC AIN networks. While the FCC has referred to this proceeding by the misnomer "Intelligent Networks," what actually is being examined is AIN unbundling. AT&T has advocated the same position before the FCC as it does in its petition, i.e., that direct access to AIN triggers is possible without mediation. Since AT&T has not been successful in convincing the FCC, it is also actively lobbying this same position in state proceedings. The public record for FCC Docket 91-346, however, clearly demonstrates that direct access to AIN triggers

is not technically feasible without implementation of mediation functions at both the network and operational support systems levels.

In addition to participation in the FCC proceeding on AIN unbundling, the Tier 1 ILECs are participating in a plan called the "Industry IN Project." This effort is intended to develop technical standards and business processes necessary to provide third parties access to ILEC AIN networks at all interconnection points, including AIN triggers. Although the FCC has not yet officially endorsed the Industry IN Project, the Tier 1 ILECs have started the process of implementing this plan. An independent company was contracted by the Tier 1 LECs to solicit the industry for their interest in participating in the IN Project. Five hundred thirty-six letters were mailed in March 1996 to 382 separate business entities. Sixty-eight companies responded to the letter. Forty companies expressed interest in participating, with 19 willing to participate in the project planning phase. Various conference calls beginning in April 23, 1996 have been held by this formal IN Project Organizing Committee to develop a plan for this project.

Thus far, AT&T has decided not to participate in the Industry IN Project. This suggests that AT&T is not seriously interested in obtaining access to AIN triggers. GTE recommends that the

Commission use the results of the FCC Docket and the Industry IN Project to direct its decisions on the unbundling of AIN.

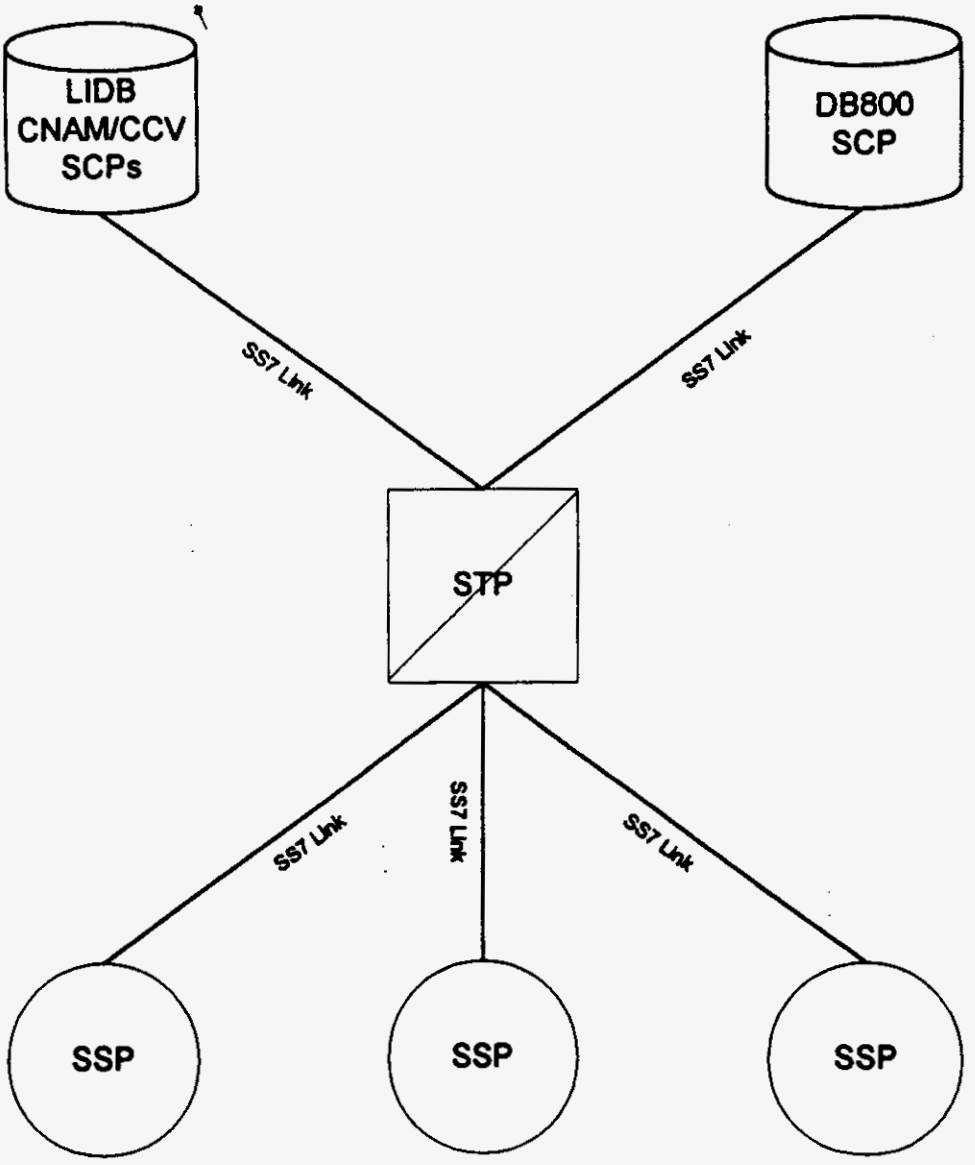
**Q. WILL YOU PLEASE SUMMARIZE YOUR TESTIMONY?**

A. AT&T's request for direct access to AIN is not technically feasible because adequate mediation does not exist to protect the reliability and security of the public local exchange network. In addition, direct access to AIN raises significant operational concerns. GTE is working with the industry to develop solutions to AIN unbundling. Until these solutions are developed, however, AT&T should not be permitted the direct access it seeks in its petition.

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

A. Yes, it does.

# *Intelligent Network (IN) Architecture*



**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF WILLIAM E. MUNSELL**

**DOCKET NO. 960847-TP**

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

A. My name is William E. Munsell. My business address is 600 Hidden Ridge, Irving, TX, 75038.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations as Senior Product Manager-Switched Access Service.

**Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATION AND WORK EXPERIENCE.**

A. I have an undergraduate degree in Economics from the University of Connecticut, and a masters degree from Michigan State University in Agricultural Economics. I joined GTE in 1982 with GTE of Florida. During the course of my career with GTE I have held positions in Demand Analysis, Pricing and Product Management.

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

A. I will describe the requirements of the Telecommunications Act of 1996 ("Act") regarding interconnection of alternative local exchange carriers ("ALECs") with the networks of incumbent local

exchange carriers ("ILECs") and compare those requirements against the request of AT&T for interconnection, transport and termination. First, I will generally describe interconnection, transport and termination and the issues raised by each of them, then discuss the Act's requirements. Next, I will list the open issues between the parties with regard to these network functions, and discuss in detail GTE's position on these issues. This process will show that GTE's positions are entirely consistent with both public policy and the objectives and requirements of the Act.

**Q. PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY.**

A. The Act requires GTE to (1) permit any requesting telecommunications carrier to interconnect with its network and (2) establish reciprocal compensation arrangements for the transport and termination of telecommunications. Further, the Act sets forth certain minimum conditions and rate standards for interconnection, transport and termination. Apparently, AT&T reads these conditions to require GTE to interconnect at any point AT&T requests, provide interconnection at below cost rates and use bill-and-keep as a billing methodology for transport and termination. While the Act allows significant flexibility in the parties' arrangements for interconnection, transport and termination, it nevertheless imposes fair and rational limits. As provided under the Act, AT&T should be permitted to

interconnect only at technically feasible points. Furthermore, GTE should be allowed to charge rates for interconnection, transport and termination that are just, reasonable and nondiscriminatory and that allow GTE full recovery of its costs.

**Q. PLEASE DESCRIBE THE TERMS INTERCONNECTION, TRANSPORT AND TERMINATION AS USED IN THE ACT.**

A. At their basic levels, the terms interconnection, transport and termination refer simply to functions within and between telephone networks. Interconnection means the physical linking of two networks for the mutual exchange of traffic. Interconnection takes place at a point of interconnection.

Transport means carrying a call between switches, or from a point of interconnection to a switch. Thus, transport may involve transmission of a call from a tandem switch to an end office switch or from one end office switch to another end office switch. (End offices are the facilities housing the switches that serve local calling areas. Each end office "subtends" a tandem switch, meaning the end office is connected via a truck to the tandem switch. Tandem switches aggregate traffic from end offices and either redistribute that traffic to other subtending end offices, passs it on to other tandem switches or pass the traffic on to an interexchange carrier. An incumbent local exchange carrier may, but does not always, own the tandem switch which

its end offices subtend.) Finally, termination means switching that is performed at the end office, and the delivery of the call to the called party.

**Q. IS INTERCONNECTION A NEW CONCEPT?**

A. No. Interconnection has been taking place among local telephone companies for many years. Historically, local telephone service was provided in a given local calling area by a single company. This company was the local exchange carrier ("LEC") or, under the Act, an incumbent local exchange carrier ("ILEC"). If a customer wanted to call a number in the same local calling area, the ILEC was able to accomplish origination, switching and termination of the call within its own single network. If, however, the customer wished to call a number in a calling area serviced by a different ILEC, the customer's call would have to be passed to and terminated by the other ILEC's network. The two ILECs exchanged traffic through interconnection arrangements which allowed each ILEC to terminate the other ILEC's calls.

**Q. WHAT IS THE PURPOSE OF THE INTERCONNECTION PROVISIONS OF THE ACT?**

A. The Act seeks to create a competitive environment for local telephone service and, thus, requires telephone companies competing in the same local calling area to interconnect. In addition to the ILEC, there may be one or more alternative local

exchange carriers ("ALECs") in the same local calling area in the near future. Without interconnection, ALECs would not be able to terminate calls to customers served by the ILEC or another ALEC, and ILECs would not be able to terminate calls to ALECs. Thus, interconnection under the Act makes competition in local telephone service possible.

**Q. CAN INTERCONNECTION TAKE PLACE ANYWHERE WITHIN THE ILEC'S NETWORK?**

A. No. Interconnection between ILECs for the exchange of traffic between two local calling areas often takes place at mutually acceptable meet points. Under the Act, interconnection may take place only at points where interconnection is technically feasible. The following factors, among others, may frustrate or even prevent interconnection:

- compatibility of the ALEC's equipment with the ILEC's equipment at the point of interconnection;
- the number of ALECs desiring interconnection at a given point;
- whether an ILEC's switching and transport equipment can handle additional traffic; and
- to the extent that collocation of the ALEC's equipment at the ILEC's end office is necessary (see Ries Direct Testimony), physical space at an ILEC end office, tandem switch or other facility.

Accordingly, end offices, tandem switches and mutually acceptable meet points are most often used as points of interconnection as they usually pose the fewest technical problems. Interconnection at an end office allows the interconnector access to the line equipment, and thus the customers, served by that end office. Interconnection at a tandem switch allows access to all end offices subtending that tandem.

**Q. PLEASE DESCRIBE THE COSTS INVOLVED IN INTERCONNECTION.**

A. Once an ILEC interconnects with an ALEC, the ILEC can complete the ALEC's calls by transporting and terminating those calls over its network system, and vice versa. When an ILEC or ALEC transports and terminates its own traffic, the costs of transport and transmission are part of the carrier's overall costs. With interconnection, an ILEC or an ALEC still incurs costs for the transport and termination of calls it terminates for other carriers. Thus, in interconnection agreements, ILECs and ALECs usually quantify these costs at a given rate per minute of usage.

**Q. DO TRANSPORT AND TERMINATION COSTS VARY DEPENDING ON THE NATURE OF THE INTERCONNECTION?**

A. Yes. These costs may differ depending on the extent to which

completion of calls from the point of interconnection involves tandem switching and transport. If an ALEC interconnects with an ILEC at an end office, the ILEC will incur the cost of switching at the end office and termination to the end user. If, on the other hand, an ALEC interconnects with an ILEC at a tandem switch, the ILEC incurs the costs of switching at the tandem office, transport to the end office, switching at the end office and termination to the end user. Thus, parties to an interconnection agreement will take into account the functions of tandem switching, transport and termination involved and generally price these elements separately.

**Q. WILL INTERCONNECTION COSTS GENERALLY BE THE SAME FOR ILECS AND ALECS?**

A. No. The cost of transport and termination will generally be higher for an ILEC than an ALEC because ILEC equipment is older and also because ILEC equipment will tend to have a lower throughput than ALEC equipment. Generally, ILECs have older switches and transmission plant in their networks. ALECs are just now entering the local exchange business and are installing currently available switches and transmission plant. New equipment is often less expensive per unit of traffic than older equipment already deployed by the ILECs. With regard to GTE specifically, traffic on GTE's network is usually dispersed throughout a large network of end offices and tandem switches, which serves a relatively large

number of low volume residential or rural customers. By contrast, an ALEC will have relatively few end office switches which can be expected to serve a relatively large number of high volume business customers. Thus, because an ALEC's network is handling a relatively higher volume of traffic through fewer switches, an ALEC's switches and transmission plant can be expected to have a higher throughput than an ILEC's switches and transmission plant. Because the total capacity of an ALEC's network tends to be more fully utilized than the capacity of the ILEC's network, the ALEC's per unit cost for carrying that capacity will be lower than the ILEC's per unit cost.

**Q. WHAT ARE THE IMPLICATIONS OF THESE DIFFERING COST STRUCTURES FOR INTERCONNECTION AGREEMENTS BETWEEN ILECS AND ALECS?**

A. If a transport and termination agreement accurately reflects the true relative costs incurred by an ALEC and an ILEC for terminating each other's traffic, the agreement will, most likely, provide that the ILEC recovers its costs at a higher rate than the ALEC. If, however, a transport and termination agreement provides for symmetrical rates (i.e., each carrier charges the other the same price), the agreement does not necessarily reflect the actual costs of interconnection for each party.

**Q. ARE COMPENSATION ARRANGEMENTS NORMALLY INCLUDED IN INTERCONNECTION AGREEMENTS?**

A. Yes. Transport and termination agreements usually include a compensation arrangement to allow the parties to bill the amounts owed to one another on a periodic basis. Alternatively, transport and termination agreements may provide for a "bill-and-keep" system whereby each party keeps whatever it bills to the end user and does not pay the other party for the costs of transport and termination. Where traffic exchanged between the two carriers is approximately equal, a bill-and-keep system may be appropriate. Moreover, as discussed above, the cost of transport and termination for an ILEC is unlikely to be equivalent to the cost of transport and termination for an ALEC. As such, rendering periodic bills is quite often the only way an ILEC can recover its reasonable costs of transporting and terminating traffic for an ALEC.

**Q. WHAT ARE CARRIERS' OBLIGATIONS WITH REGARD TO INTERCONNECTION, TRANSPORT AND TERMINATION UNDER THE ACT?**

A. Section 251(a) of the Act requires all telecommunications carriers, including ILECs and ALECs, "to interconnect directly or indirectly with the facilities and equipment of other telecommunications carriers." Section 251(b) requires all local exchange carriers, including ILECs and ALECs, "to establish reciprocal compensation

arrangements for the transport and termination of telecommunications."

Furthermore, Section 251(c) requires ILECs to provide, for any requesting telecommunications carrier, interconnection

> (A) for the transmission and routing of telephone exchange service and exchange access;
>
> (B) at any technically feasible point within the carrier's network;
>
> (C) that is at least equal in quality to that provided by the local exchange carrier to itself or any subsidiary, affiliate, or any other party to which the carrier provides interconnection; and
>
> (D) on rates, terms, and conditions that are just, reasonable, and nondiscriminatory, in accordance with the terms and conditions of the agreement and the requirements of this section and section 252.

**Q. DOES THE ACT ADDRESS THE METHOD OF PRICING INTERCONNECTION SERVICES?**

A. Although the parties are free to negotiate the price of interconnection, in the event the parties seek arbitration by a State commission under section 252 of the Act, rates for interconnection set by the State commission shall be "based on the cost (determined without reference to a rate-of-return or other

rate-based proceeding) of providing the interconnection. . .and. . .nondiscriminatory, and. . .may include a reasonable profit." (Act sec. 252(d)(1)(A)-(B).)

**Q. DOES THE ACT ALSO ADDRESS PRICING FOR TRANSPORT AND TERMINATION?**

A. Yes. It provides that a State commission may not consider the terms and conditions of reciprocal compensation to be just and reasonable unless such terms and conditions "provide for the mutual and reciprocal recovery by each carrier of costs associated with the transport and termination on each carrier's network facilities of calls that originate on the network facilities of the other carrier" and determine costs "on the basis of a reasonable approximation of the additional costs of terminating such calls." (Act §252(d)(2)(A)(i)-(ii).) Section 252(d) also states that such pricing standards shall not be construed to prevent parties from arranging for "the mutual recovery of costs through the offsetting of reciprocal obligations, including arrangements that waive mutual recovery (such as bill-and-keep arrangements)." (Act section 252(d)(2)(B)(i).)

**Q. HOW DID THE FCC INTERPRET THE ACT'S LANGUAGE REGARDING INTERCONNECTION POINTS?**

A. The FCC established a minimum set of technically feasible points of interconnection at end offices and tandem switches. (See

Order at ¶¶ 207-212.) These points are (1) the line-side of a local (i.e., end office) switch, (2) the trunk side of a local switch, (3) the trunk interconnection points for a tandem switch, (4) central office cross-connect points, (5) out-of-band sigaling transfer points and (6) the points of access to unbundled elements. (Order at ¶ 212.)

The FCC interpreted technical feasibility to require modification of ILEC equipment if necessary to facilitate interconnection. (Order at ¶ 202.) The FCC emphasized, however, that the obligation to interconnect wherever technically feasible is warranted only because an ILEC is entitled to recover from the ALEC its costs of providing interconnection, including a reasonable profit. (Order at ¶ 199.) Moreover, an ILEC may refuse interconnection if it can demonstrate specific and significant adverse impacts to network reliability and security. (Order at ¶ 203.) Finally, with regard to technical feasibility, the FCC stated that interconnection "at a particular point in a network, using particular facilities, is substantial evidence that interconnection or access is technically feasible at a given point, or substantially similar points in networks employing substantially similar facilities." (Order at ¶ 204.)

**Q. DID THE FCC ESTABLISH GUIDELINES FOR THE STATES TO USE IN SETTING INTERCONNECTION RATES?**

A. Yes. The FCC required State commissions to set rates for interconnection under a forward-looking economic cost pricing methodology. (See Order at ¶¶ 630-740.) This methodology is the Total Element Long-Run Incremental Cost ("TELRIC") of interconnection, plus a reasonable allocation of forward-looking joint and common costs. (Order at ¶¶ 672-673.) In computing TELRIC, State commissions should not assume a hypothetical network. Instead, TELRIC should be computed based on the "most efficient technology deployed in using the [ILEC's] current wire center locations." (Order at ¶ 685.) TELRIC does not include *embedded costs*, ILEC *opportunity* costs, universal service subsidies or access charges. Id. ¶¶ 704-732. If a State commission cannot determine rates based on TELRIC for interconnection, the FCC established default rates for a number of elements including end office switching, tandem switching and transport. (See Order at ¶¶ 787-827.)

**Q. IS A DIFFERENT PRICING STANDARD REQUIRED FOR TRANSPORT AND TERMINATION?**

A. Although the Act separates transport and termination from interconnection, and establishes separate pricing standards for them, the FCC stated that the two pricing standards are sufficiently similar "to permit the use of the same general methodologies for establishing rates under both statutory provisions." (Order at ¶ 1054.) Thus, State commissions must

set rates according to one of three options. First, they can set the rates for transport and termination at TELRIC plus a reasonable allocation of joint and common costs. (See Order at ¶¶ 1056-59.) Second, they can set rates at default rates pending completion of a TELRIC study. (See Order at ¶¶ 1060-62.) Third, they can impose a bill-and-keep arrangement if traffic is approximately equal. (See Order at ¶¶ 1111-18.)

With regard to TELRIC and default rates, the FCC established the presumption that an ILEC's prices for transport and termination are a suitable proxy for an ALEC's costs of transport and termination. (Order at ¶ 1085.) Thus, the FCC ruled that TELRIC and default rates should be presumed to be symmetrical unless this presumption can be rebutted. (Order at para. 1089.)

With regard to bill-and-keep, the FCC ruled that State commissions may impose bill-and-keep arrangements if (1) neither carrier has rebutted the presumption of symmetrical rates and (2) the volume of terminating traffic from one network to the other is "approximately equal to the volume" of terminating traffic flowing the other way "and is expected to remain so." (Order at ¶ 1111.)

**Q. PLEASE IDENTIFY THE ISSUES THAT ARE IN DISPUTE BETWEEN GTE AND AT&T AND THEIR RESPECTIVE POSITIONS.**

A. AT&T has alleged a range of structural, pricing and billing issues with regard to interconnection, transport and termination. GTE contends that AT&T's positions on open issues are not warranted by the Act, and amount to little more than an attempt by AT&T to place GTE at a competitive disadvantage by compromising GTE's network and denying GTE recovery of its costs. The issues presented in this proceeding are:

(1) *At which points in GTE's network is GTE required to provide interconnection?*

**AT&T's Position:** AT&T may interconnect at any point where GTE has already provided interconnection to any other ILEC.

**GTE's Position:** AT&T may interconnect with GTE at any of the minimum technically feasible points required by the FCC. Interconnection at additional points where other ALECs have already interconnected is not presumptive. Interconnection can only occur if technically feasible, if it will not threaten network reliability or security and if GTE's costs can be recovered.

(2) *Should GTE allow AT&T to route calls between its tandem switches?*

**AT&T's Position:** GTE must allow AT&T to switch traffic between tandem switches ("inter-tandem switching").

**GTE's Position:** GTE will not provide this service absent AT&T's participation in established methods for billing inter-tandem traffic.

(3) *What should be the rate for interconnection and for transport and termination?*

**AT&T's Position:** GTE's rates should be equal to TELRIC, and forward looking joint and common costs aside from TELRIC would be virtually zero.

**GTE's Position:** Rates should be determined according to the Efficient Component Pricing Rule ("ECPR").

Pending judicial review of the FCC's Order, rates should be set at TELRIC *plus forward looking joint and common* costs. AT&T's estimate of GTE's forward looking joint and common costs are incorrect and have severely underestimated those costs. Additionally, GTE should be allowed a true-up of its costs should it be eventually allowed to recover its costs under ECPR.

(4) *Should the rate for transport and termination be symmetrical?*

**AT&T's Position:** The FCC's Order requires symmetrical rates that are set according to GTE's costs.

**GTE's Position:** Rates for transport and termination should not be symmetrical as such rates would not provide for mutual and reciprocal recovery of costs.

Pending judicial review of the FCC's Order, a comparison of cost studies by GTE and AT&T justify a departure from symmetrical pricing.

(5) *Should bill-and-keep be used as a reciprocal compensation arrangement for transport and termination?*

**AT&T's Position:** At least for an interim period, a bill-and-keep system should be used.

**GTE's Position:** While GTE's preferred position is asymmetrical rates as stated above, the Compnay is willing to enter into bill-and-keep arrangements only where traffic is approximately equal and other specified parameters are met.

**Q. ARE AT&T'S POSITIONS CONSISTENT WITH THE PROVISIONS OF THE ACT?**

A. No. The Act was intended to remove barriers to entry and create a level playing field for competition. It was not intended to endanger the security of an ILEC's network, require significant capital investment by the ILEC or result in the ILECs paying a subsidy to ALECs in the form of below cost rates for interconnection. Yet AT&T's approach to interconnection, transport and termination may compromise the security of GTE's network and fail to allow GTE to recover its costs, much less "a reasonable profit" as the Act permits.

Accordingly, GTE maintains its negotiating positions on the disputed issues. To the extent these positions may be considered inconsistent with the FCC's interpretation of the Act, GTE offers alternative interim positions on several issues should the Commission determine the FCC's conclusions to be binding pending judicial review.

Below, I elaborate on GTE's positions on the specific issues presented for resolution in this arbitration.

**Q. IS GTEFL REQUIRED TO PROVIDE INTERCONNECTION AT ANY POINT AT WHICH GTE HAS ALREADY PROVIDED INTERCONNECTION?**

A. No. While parties may have considerable flexibility as to where and how they may wish to interconnect, interconnection cannot take place at any point and in whatever manner AT&T wants. The Commission should not presume, as AT&T argues, that it is technically feasible to provide AT&T with interconnection anywhere GTE has already provided interconnection. This approach is not required by the FCC's Order, which states only that interconnection at a particular point using particular facilities is "substantial evidence" of technical feasibility at that point, or at "substantially similar points in networks employing substantially similar facilities." (Order at ¶ 204.) Accordingly, AT&T's requested point must be substantially similar and employ substantially similar facilities, and even then interconnection is only "substantial evidence" of technical feasibility--technical feasibility is not presumed.

**Q. IS AT&T CORRECT IN ITS ASSUMPTION THAT THE COSTS OF INTERCONNECTION AT ANY PARTICULAR POINT IN GTE'S NETWORK ARE ABOUT THE SAME?**

A. No. It would be incorrect for the Commission to adopt this blanket presumption, advanced by AT&T, given the reality of how ILEC networks are constructed. First, switches, transmission equipment and computer software may be interoperable within the GTE network, but they are not necessarily uniform throughout the network. For example, GTE deploys a wide variety of

switches. While GTE may use a Northern Telecom switch in one end office, another end office in the same geographic area may use an AT&T switch. Second, interconnection of an ALEC with GTE at one point may have been the result of lengthy negotiations in which the interconnecting ALEC agreed to pay for and use certain technology that is compatible with the GTE equipment at that point. Thus, while superficially simple, AT&T is incorrect in presuming that technical feasibility at a given point implies technical feasibility at all other similar points for all other ALECs.

**Q. WHAT STANDARD SHOULD THE COMMISSION ADOPT FOR JUDGING AT&T'S INDIVIDUAL REQUESTS FOR INTERCONNECTION?**

A. The Commission should determine technical feasibility on a case-by-case basis and should consider GTE's evidence that AT&T's proposed plan for interconnection is not technically feasible at the points AT&T has requested.

**Q. ARE THERE ANY ISSUES THAT MUST BE RESOLVED BEFORE GTE COULD PROVIDE INTER-TANDEM SWITCHING?**

A. GTE only has one tandem in Florida. Therefore, inter-tandem trunking should not be an issue today. However, there is nothing to prevent a new entrant from establishing a tandem sometime in the future, such that the tandem switching issue might present itself later. In that case, GTE's position is that it would not

perform inter-tandem switching unless AT&T agreed to current methods for billing inter-tandem traffic. While interconnection generally takes place between the end office of the ALEC and the tandem switch or end office of the ILEC, interconnection at a tandem switch allows access to all end offices that subtend that tandem switch. As such, completion of calls for an interconnecting ALEC which interconnects at a tandem switch will typically involve tandem switching, transport between the tandem switch and the subtending end office and termination from the end office to the customer, but does not involve transport between tandem switches.

AT&T apparently wishes to change this structure. Under the modified structure, in a local access and transport area ("LATA"), AT&T would interconnect at a single tandem switch, but nevertheless gain access to all end offices in the LATA, regardless of whether the end offices subtend the tandem switch where AT&T has interconnected. Accordingly, GTE would have to perform switching between tandem switches--inter-tandem switching--in order to complete AT&T calls.

GTE cannot agree to this kind of interconnection arrangement. Such interconnection is technically possible--GTE engages in inter-tandem switching with many ILECs in order to route ILEC intra-LATA toll traffic. However, unless AT&T agrees to the billing

methods necessary to implement inter-tandem switching, GTE cannot allow such interconnection as there would be no way to bill for all of the network elements involved in the completion of calls from AT&T. Specific billing methods are necessary because of the way inter-tandem traffic is exchanged. Signaling information from the switch, as well as the current industry standard Automatic Message Accounting ("AMA") record format, does not identify more than one tandem switching occurrence. Thus, if more than one tandem switch is used to route a telephone call, the additional switches are not reflected in the billing record.

**Q. CAN YOU ILLUSTRATE THE NATURE OF THIS PROBLEM?**

A. Yes. If a call originates in end office "A," the call is transported to tandem switch "B," which end office A subtends. Under AT&T's proposal, the call would then be trunked to a second tandem switch "C" and then switched to end office "D," where the call would be completed. The signaling message information and AMA record only provides information that is normally necessary to complete the call--it will identify end office A, tandem switch B and the terminating end office D. **There will be no billing information with regard to tandem switch C.** Accordingly, the service provider that owns tandem switch C will not be able to recover tandem switching charges from the service provider that owns end office A.

**Q. HAVE BILLING METHODS BEEN DEVELOPED FOR INTER-TANDEM SWITCHING BETWEEN ILECS?**

A. Yes. As ILECs engage in inter-tandem switching for intraLATA toll traffic, billing methods have been developed to allow the recovery of tandem switching in the above scenario. To recognize the lack of necessary data in signaling message information and AMA records, ILECs recover the cost of inter-tandem switching through the use of various "clearinghouse" systems. In these clearinghouse systems, the end office of the ILEC originating an intraLATA toll call creates an Electronic Message Record ("EMR") call record which contains information such as the originating number, terminating number, time and date of the call. These records are forwarded by the ILEC to the clearinghouse. The clearinghouse then identifies the terminating number from the EMR call record as being served by a specific terminating ILEC and, based on the most probable pathway for the call, returns billing information to the ILECs identified as service providers of portions of the call route.

**Q. ARE YOU AWARE OF ANY OTHER BILLING METHODS CURRENTLY AVAILABLE TO IDENTIFY AND RECOVER THE COSTS OF INTER-TANDEM SWITCHING?**

A. No. Unless AT&T were willing to enter into the arrangement described above, there would be no way for GTE to recover the costs of traffic switched by its tandems. This result would run

directly contrary to the Act and the FCC's Order, which require that GTE recover the costs of interconnection. (See Act at § 252(d)(1)(A)(i) (1996); Order at ¶¶ 29, 199, 618-24.) AT&T opposition to GTE's position would be surprising, considering that it is by no means a new entrant into the telecommunications market and is entirely familiar with access billing and switching standards. The Commission should thus reject any request for inter-tandem switching.

**Q. DOES AT&T'S METHOD FOR CALCULATING THE COST OF INTERCONNECTION, TRANSPORT AND TERMINATION ACCURATELY REFLECT GTE'S COSTS?**

A. No. AT&T's cost calculation methodology grossly underestimates GTE's costs. As is more fully described in the testimony of GTE witness Sibley, the only appropriate method for calculating GTE's cost of interconnection, transport and termination is through use of the efficient component pricing rule ("ECPR"). Pending judicial review of the Order's mandate of TELRIC plus a reasonable allocation of forward-looking joint and common costs as a method for computing the cost of interconnection and transport and termination, GTE disagrees with AT&T's calculation of GTE's TELRIC, and AT&T's general dismissal of joint and common costs. GTE's basis for disagreeing with AT&T over this calculation is also discussed in witness Sibley's testimony and the associated economic study.

**Q. DOES SYMMETRICAL PRICING ALLOW RECIPROCAL AND MUTUAL RECOVERY OF COSTS AS A REASONABLE APPROXIMATION OF THE COST OF TERMINATING CALLS?**

A. No. Although required by the FCC, symmetrical pricing is completely at odds with the requirements of the Act. Section 252(d)(2)(A)(i) of the Act requires that the terms and conditions for transport and termination must "provide for the mutual and reciprocal recovery by each carrier of costs . . . of calls that originate on the network facilities of the other carrier." The terms and conditions for transport and termination must "determine such costs on the basis of a reasonable approximation of the additional costs of terminating such calls." (Act at § 252(d)(2)(A)(ii).)

Symmetrical pricing between AT&T and GTE will not afford GTE recovery of its costs. AT&T's costs for terminating calls will, most likely, be less than GTE's costs for terminating calls. As discussed above, this is due to the expectation that AT&T will have deployed newer equipment in its network using a relatively higher percentage of its network's capacity. Using symmetrical pricing, AT&T will receive a subsidy from GTE, because it will be receiving far more than the cost it incurs to complete a call. Thus, GTE's costs are not a suitable proxy for determining the actual costs of interconnection, meaning that symmetrical pricing does not allow for mutual or reciprocal recovery of costs and is

not based on a reasonable approximation of the additional cost of terminating calls. Accordingly, the Commission should adhere to the letter and intent of the Act and allow the parties to recover their respective true costs of transport and termination.

At a minimum, pending judicial review of the FCC's Order, the cost studies submitted by GTE justify a departure from symmetrical pricing, as GTE believes its costs for transport and termination to be significantly higher than AT&T's costs. (See Trimble testimony.) GTE's costs are thus not a suitable proxy for AT&T's costs, and symmetrical pricing is not justified.

If, however, the Commission decides symmetrical pricing is justified pending judicial review of the Order, GTE should be allowed a true-up of its costs in the event the FCC's requirement of symmetrical pricing is eventually overturned.

**Q. IS THE BILL-AND-KEEP METHOD OF PRICING APPROPRIATE OR NECESSARY?**

A. No. The Act requires that transport and termination arrangements allow for "the mutual recovery of costs through the offsetting of reciprocal obligations." (Act at § 252(d)(2)(B).) Among the other possible options for mutual recovery of costs, parties may opt for "arrangements that waive mutual recovery (such as bill-and-keep arrangements)," (Order at ¶ 252(d)(2)(B)), but are not required to

do so. Thus, the Act does not require or permit the Commission or the FCC to impose bill-and-keep on GTE and AT&T.

The Commission is likewise not required to impose bill-and-keep under the FCC's Order. The Order states that a State commission "may" impose bill-and-keep if neither party has rebutted the presumption of symmetrical pricing and if the volume of traffic exchanged is approximately equal. (See Order at ¶ 1111.) Not only has GTE rebutted the presumption of symmetrical pricing, but there presently exists no way for the Commission to determine whether the volume of traffic exchanged will, in fact, be equal. Thus, neither precondition has been met. Moreover, because the FCC allows State commissions to impose bill-and-keep if both preconditions are met, it has misread the statute, which clearly allows bill-and-keep arrangements but does not mandate them under any circumstances.

While GTE's preferred position is as stated above, the Company is willing to enter into a bill-and-keep compensation arrangement given certain parameters. The proposed arrangement, predicated upon approximately equivalent traffic flows, would be for the transport and termination of end user **local** traffic. The arrangement would specifically exclude any toll or access traffic. Also, interLATA access traffic must be carried over separate trunk

groups and may not be included with the local and local toll traffic.

GTE, in an effort to expedite the competitive process, is proposing a fairly broad definition of roughly balanced. The Company is proposing that roughly balanced equate to plus or minus ten percentage points. This means that the originating/terminating split could be up to 60/40.

GTE is willing, in the spirit of the Act, to compromise regarding the issue of bill and keep. The above definition, in conjunction with certain parameters, is a reasonable approach. The following parameters are fundamental to GTE's proposed bill-and-keep arrangement:

1. The arrangement applies to the termination of interconnected calls and does not apply to internetwork facilities.

2. The arrangement applies to local and EAS traffic only and has no implications for access (or wireless) compensation.

3. Traffic must be local end user traffic. An ALEC may not aggregate traffic other than its end user local/mandatory EAS traffic for the purposes of this arrangement.

4. Traffic is assumed to be roughly balanced unless there are records available which would indicate otherwise. Either party may request traffic studies be performed on not more frequently than a quarterly basis.

5. If traffic studies indicate that traffic is outside of the roughly balanced range, either party may request that billing commence utillizing agreed upon rates no lower than GTE's TELRIC plus the appropriate joint and common costs, as I discussed earlier in my testimony.

6. Either party may terminate the arrangement with twelve months notice.

**Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

A. While interconnection is a significant step towards creating a competitive market for local exchange services, this step is not intended to open up GTE's network to interconnection at any point for any price. Rather, interconnection, as well as the transport and termination facilitated by interconnection, is intended to allow ALECs access to the local exchange consistent with the integrity of the network at a rate that is just and reasonable. Accordingly, the Commission should:

- allow interconnection at the points specified by the FCC,

and determine technical feasibility for other points only in accord with the evidence set forth in this proceeding;

- reject inter-tandem switching, unless GTE can recover its costs;

- use ECPR to determine the cost of interconnection, transport and termination, or at least reject AT&T's gross underestimate of TELRIC and joint and common costs and allow GTE a true-up if TELRIC is eventually rejected on judicial review of the Order;

- reject symmetrical pricing for transport and termination, or allow GTE a true-up if symmetrical pricing is rejected on judicial review of the Order; and

- allow bill-and-keep compensation only with the parameters specified herein.

**Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

A. Yes, it does.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF JOHN W. RIES**

**DOCKET NO. 960847-TP**

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

A. My name is John W. Ries. My business address is 600 Hidden Ridge, Irving, TX, 75038.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations as Product Manager - Expanded Interconnection Services.

**Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE.**

A. I graduated from the University of Missouri - Columbia in 1982 with a Bachelor of Arts degree in Mathematics and Statistics. My employment with GTE commenced in May 1982 in the Network Planning Department. I held several positions during my first six years with Network Planning. My responsibilities included capital budgeting, capital portfolio management, implementation of enhanced support products for Network Planning, and coordination of technical responses for business customer requests. In 1988 I moved into the Business Pricing group and remained there for four years. My responsibilities in the Business Pricing group included the pricing of new network services for tariff offerings as well as

the pricing of individual case applications. I served as Section Manager of the Business Pricing group and supervised eight employees. In March 1992 I began working on a special project for the implementation of facsimile services for GTE.

In December 1992 I assumed my current position as Product Manager for Expanded Interconnection Services. My responsibilities over the last two years have been to coordinate GTE's response to the FCC 91-141 Order on Special Access and Switched Transport Interconnection. As such, I have been responsible for organizing resources from several different departments within GTE to determine how GTE would offer physical and virtual collocation. I have worked with Engineering personnel to develop rates and Tariffs personnel to develop the tariff structure. I have also been responsible for educating and training each of GTE's regions on the various aspects of collocation and working with each regional team on how to implement collocation once requests were received. I have been active in responding to various State commissions on issues regarding collocation practices and principles, as well as responding to various customers regarding GTE's offerings under Expanded Interconnection. I am currently in the process of implementing GTE's plans to refile federal and state tariffs to allow for physical collocation under the FCC's 96-325 order with regard to

implementation of local competition. I am also reviewing all interconnection agreements dealing with physical collocation.

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

A. I will describe collocation in the telecommunications context, explain the collocation requirements under the federal Telecommunications Act of 1996 ("the Act"), and present GTE's position on the collocation issues that have been contentious in the negotiations with AT&T.

In brief, GTE recognizes that the Act requires incumbent local exchange carriers ("ILECs") to allow competing telecommunications carriers to place equipment on their premises if necessary to interconnect with unbundled elements of an ILEC's network. But AT&T has taken the position that the Act permits AT&T to have virtually unencumbered access to all of GTE's facilities to collocate whenever it is to AT&T's convenience or advantage. AT&T's extreme position is unsupported by the Act, which is careful to limit collocation to what is necessary for fair competition.

**Q. WHAT IS COLLOCATION?**

A. Collocation can take two forms, "physical collocation" and "virtual collocation."

**Physical collocation** essentially enables an interconnector to set up a mini-facility on the premises of a local exchange carrier ("LEC"). The LEC leases a portion of the space in its facility to the interconnector, which then places its own equipment in the segregated space. Typically, that space is enclosed by "cages" or similar structures to provide security for the ILEC facilities and the installed equipment. The interconnector is permitted to enter the facility to install, maintain, and repair collocated equipment.

In the case of **virtual collocation**, the interconnector does not occupy a portion of the LEC's facility, nor does it own the equipment that is used to interconnect with the LEC's network. Instead, the LEC owns or leases the equipment necessary to terminate the interconnector's circuits and dedicates that equipment to the exclusive use of the interconnector. This dedicated equipment is housed inside the LEC's facility (usually the central office) and is linked to the interconnector's circuits outside the facility (typically at a manhole). As opposed to physical collocation, the LEC provides installation, maintenance and repair services for the equipment.

**Q. WHAT IS THE PURPOSE OF COLLOCATION?**

A. A central objective of the Act is to facilitate competition in local exchange markets by allowing new entrants to interconnect with unbundled elements of an ILEC's network. For example, an

alternative local exchange carrier ("ALEC") may wish to terminate its own transmission links and interconnect them with an ILEC's switch, located in the central office, for routing to individual customers. In doing so, it may want to utilize its own circuit termination equipment rather than purchase termination and transport service from the ILEC. For technical reasons (e.g., the cable required to cross-connect two communications circuits cannot exceed a certain length), the ALEC's circuit termination equipment must be in close proximity to the ILEC's network equipment. In these circumstances, it may be necessary to allow the ALEC to "collocate" its equipment on the ILEC's premises.

**Q. WHAT ARE THE ILEC'S COLLOCATION OBLIGATIONS UNDER THE ACT?**

A. The Act takes account of the technical need to provide some level of collocation to enable ALECs to interconnect with an ILEC's network and access to unbundled network elements. Section 251(c)(6) of the Act sets out an ILEC's collocation obligations. It states that an ILEC has: "The duty to provide, on rates, terms, and conditions that are just, reasonable, and nondiscriminatory, for physical collocation of equipment necessary for interconnection or access to unbundled network elements at the premises of the local exchange carrier, except that the carrier may provide for virtual collocation if the local exchange carrier demonstrates to the State

commission that physical collocation is not practical for technical reasons or because of space limitations."

The FCC has interpreted this provision to require collocation to be provided:

- on a physical or virtual basis at the request of an ALEC;
- at "all buildings or similar structures owned or leased by the incumbent LEC that house LEC network facilities";
- for transmission equipment "used" or "useful" for interconnection or access to unbundled elements, but not for switching equipment;
- for "cross-connects" between collocated ALEC equipment; and
- consistent with reasonable security measures, including cages.

(See In re Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket No. 96-98, FCC 96-325 (released Aug. 8, 1996) (the"Order") at ¶ 555 forward.)

**Q. DO GTE AND AT&T AGREE ON ALL ASPECTS OF GTE'S IMPLEMENTATION OF THESE COLLOCATION OBLIGATIONS?**

A. No. Notwithstanding the recent release of the FCC's Order, GTE and AT&T continue to disagree on a number of issues regarding implementation of the statutory provision. (Because of the short

time between release of the FCC's Order and the commencement of arbitration, GTE has been unable to confirm whether the Order has prompted AT&T to modify positions it took in negotiations.) In some cases, these disagreements appear to be predicated upon differing interpretations of the statutes or the FCC's requirements. In others, they are based on differing opinions regarding the lawfulness of the FCC's actions. As I explain below, these disagreements give rise to the issues presented in this arbitration.

**Q. PLEASE LIST THE AREAS OF CONTINUING DISAGREEMENT BETWEEN GTE AND AT&T.**

A. As I stated earlier, the issues presented in this arbitration flow predominantly from differing views of the Act's purpose and requirements and, specifically, the interpretation of Section 251(c)(6). The questions which must be resolved are:

(1) *What types of equipment are necessary for interconnection?*

**AT&T's Position:** AT&T should be permitted to collocate any type of telecommunications equipment it chooses on GTE's premises.

**GTE's Position:** AT&T should be allowed to place on GTE's premises only equipment that is technically necessary to provide basic transmission service, such as circuit

termination equipment. It should not be permitted to collocate switches, enhanced services equipment or customer premises equipment.

(2) *Should AT&T be permitted to collocate at any and every structure owned by GTE irrespective of its purpose or capabilities?*

**AT&T's Position:** GTE must allow AT&T to collocate equipment at any and all structures that house GTE network elements.

**GTE's Position:** AT&T should be permitted to collocate at central offices, serving wire centers, and tandem switches. It should be permitted to collocate equipment at remote units only if a given unit offers routing or rating capability and has sufficient space. AT&T should not be allowed to collocate at vaults or manholes.

Pending judicial review of the FCC's Order, GTE will provide collocation at central offices, serving wire centers, tandem offices, all buildings or similar structures owned or leased by GTE and housing GTE network facilities, and any structures that house GTE network facilities on public rights-of-way, so long as collocation is technically feasible, space is available,

reasonable security arrangements can be provided, and AT&T pays all costs associated with the requested collocation.

(3) *Can AT&T demand virtual collocation as an option even where physical collocation is available?*

**AT&T's Position:** AT&T should have the option of choosing virtual collocation as an alternative to physical collocation.

**GTE's Position:** GTE supports virtual collocation, but the Commission does not have the authority to mandate virtual collocation as an alternative without first determining that physical collocation is infeasible.

Pending judicial review of the FCC's Order, GTE will provide virtual collocation where technically feasible and space is available, so long as AT&T pays all costs associated with the requested collocation.

(4) *May GTE require the implementation of reasonable safety and security measures when collocation is established?*

**AT&T's Position:** No security restrictions should be imposed without a substantial and detailed showing of their necessity.

**GTE's Position:** It is logical and necessary to establish reasonable security measures to protect GTE's private facilities, as well as the equipment of collocators, from unauthorized access which could lead to damage of equipment or disruption of service.

(5) *Must GTE permit two collocators to cross-connect with each other, thereby using GTE's facility to bypass its own network?*

**AT&T's Position:** There should be no prohibitions against non-GTE carriers interconnecting with one another on GTE's premises.

**GTE's Position:** The Act does not require collocators housed on GTE property to cross-connect with each other in order to bypass GTE's network.

Pending judicial review of the FCC's Order, GTE will permit the interconnection via cross-connects of the collocated equipment of different ALECs under the following conditions: (1) the provisioning of the cross-connect by GTE or the ALECs shall be at the option of GTE, (2) the connected equipment is used for interconnection with GTE or access to GTE's unbundled network elements, (3) adequate space is

available, (4) reasonable security arrangements can be provided, and (5) the ALECs pay all costs associated with the cross-connect.

**Q. ARE AT&T'S POSITIONS ON THESE ISSUES CONSISTENT WITH THE ACT?**

A. No. AT&T is not seeking simply to collocate equipment "necessary for interconnection or access to unbundled network elements" on GTE premises as the Act allows, (at § 251(c)(6) (emphasis added)), or even equipment that is "used or useful" for that purpose. Rather, AT&T seeks to use GTE's property whenever it is to AT&T's convenience or advantage to do so. Section 251(c)(6) of the Act does not support the positions AT&T has taken in negotiations with respect to collocation.

GTE's lawyers have advised me that, even where the FCC has agreed in part with AT&T, its Order is not consistent with the scope of its authority to order collocation under the principles of statutory construction enunciated in the District of Columbia Circuit Court of Appeal's 1994 decision overturning the FCC's previous physical collocation mandate. (See Bell Atlantic Tel. Cos. v. FCC, 24 F.3d 1441, 1445 (D.C. Cir. 1994).) There, the Court said that: "The Commission's decision to grant CAPs the right to exclusive use of a portion of the petitioners' central offices directly implicates the . . . Fifth Amendment"; and that agencies may not "use

statutory silence or ambiguity to expose the Treasury to liability both massive and unforseen." The takings issue is addressed in detail in GTE's Takings Report, included in the Company's Response to AT&T's Petition for Arbitration.

Accordingly, GTE maintains its negotiating positions on the disputed issues, but offers alternative interim positions on several issues should the Commission determine the FCC's conclusions to be binding pending judicial review. It is important to keep in mind that collocation is a limited measure, designed to remove technical barriers to new local exchange providers entering the local telephone market and effectively competing with ILECs. Collocation is not intended as a vehicle by which new entrants may avoid offering true facilities-based competition by building their business on the premises of their competitors. Below, I discuss in greater detail the justifications for GTE's positions with respect to the disputed collocation issues.

**Q. SHOULD AT&T BE PERMITTED TO COLLOCATE ON GTE'S PREMISES ANY EQUIPMENT IT CHOOSES?**

A. No. In negotiations, AT&T has taken the position that Section 251(c)(6) permits it to place any type of equipment on GTE's premises, including switches, enhanced services equipment (such as voice messaging equipment), and customer premises equipment ("CPE"). This position completely disregards the plain language of

the provision which limits collocated equipment to that "necessary for interconnection or access to unbundled network elements." 47 U.S.C. § 251(c)(6) (emphasis added). While the FCC's interpretation of the "necessary" qualifier as "used or useful" is questionable, the FCC correctly concludes that switching equipment, enhanced services equipment and CPE may not be collocated. (Order at ¶¶ 579-82.) Thus, both the Act and the Order foreclose AT&T's demand to collocate on GTE facilities equipment that is not necessary. Necessity, not convenience, is the touchstone of collocation under the Act.

**Q. IS COLLOCATION OF ANY AND ALL TYPE OF EQUIPMENT NECESSARY TO ACHIEVE THE ACKNOWLEDGED PRO-COMPETITIVE GOALS OF INTERCONNECTION?**

A. No. The fundamental purpose of the "interconnection and access" provisions is to enable an interconnector to use ILEC network components without having to purchase complete switched access or exchange service. As the FCC has stated, a "'fundamental purpose of expanded interconnection . . . is to allow interconnectors to use LEC switches without having to purchase the LECs' end-to-end switched access services. If interconnectors want to do their own switching, they may place switches on their own property.'" (Expanded Interconnection with Local Tel. Co. Facilities, CC Docket No. 91-41, and Amendment of Part 36, CC Docket No. 80-286, Second Report and Order and Third Notice of

Proposed Rulemaking, 8 FCC Rcd 7374 (1993) ("Switched Access Order") at ¶ 62, (quoting PacTel Comments at 46-47).)

The FCC has recognized the importance of limiting the types of equipment that must be collocated on a LEC's premises to equipment that is necessary and directly related to the competitive provision of basic transmission service, and it has consistently rejected suggestions that LECs be required to provide collocation of enhanced services equipment, customer premises equipment, switches, or other non-transmission equipment: "LECs are not required to provide collocation of enhanced services, customer premises, or other non-transmission equipment." (Special Access Order at ¶ 63.); "In our earlier orders, we required LECs to permit interconnectors to place . . . in LEC central offices only equipment needed to terminate basic transmission facilities . . . [w]e conclude that the same principles should apply [for the policies] we adopt in this order". (Expanded Interconnection with Local Tel. Co. Facilities, Memorandum Opinion and Order, 9 FCC Rcd 5154 (1994) ("Virtual Collocation Memorandum and Order") at ¶ 94.) Congress was clearly aware of this history when it enacted Section 251(c)(6).

**Q. WHAT HARM IS THERE IN ALLOWING AT&T TO PLACE ANY TYPE OF EQUIPMENT IT WANTS TO ON GTE'S PREMISES?**

A. There are numerous negative effects, all of which will ultimately

harm consumers. If AT&T were permitted to place any type of equipment it wished on GTE's premises, it would quickly exhaust existing space available for collocation. For example, if the first party seeking collocation were allowed to install large switches, circuit termination equipment, enhanced services equipment, and customer premises equipment, inadequate space would be available for other competitors to collocate equipment essential to offering basic services. That first collocator--perhaps AT&T--would be able to monopolize the limited amount of usable space in GTE's facilities, and deny other interconnectors the opportunity to collocate on GTE's premises in order to compete directly with AT&T and GTE. Such a result would contravene the goals of the Act.

Allowing any one interconnector to use up portions of GTE's facilities with equipment unrelated to providing basic service would give rise to other adverse consequences. First, it would impinge on GTE's ability to upgrade its equipment and expand its services. Second, the placement of extraneous equipment would place additional demands on the facility's power supply. Switches, for example, demand an inordinate amount of power, and significant modifications would be required to power that equipment if AT&T were permitted to install a switch. Third, similar modifications would be required to maintain the environmental stability required by central office equipment. The public ultimately would bear these

unnecessary costs in exchange for limited or no competitive benefits. It follows that AT&T's position is inconsistent with Congress' intent to provide limited use of ILEC property for targeted pro-competitive purposes.

**Q. WHAT TYPE OF EQUIPMENT SHOULD AT&T BE PERMITTED TO COLLOCATE ON GTE'S PREMISES?**

A. Under the language of the Act, AT&T should be permitted to install only equipment that must be near GTE network elements in order to make interconnection technically feasible. Such equipment is limited to concentration and circuit termination equipment (including optical line terminating equipment and multiplexers). Concentration equipment aggregates multiple loops to a single loop for more efficient transport. Termination equipment allows an ALEC to convert the optical signals on its loops to electrical signals that can be used by GTE's network equipment. Because current cross-connection technology limits the maximum distance between these various pieces of equipment, collocation is necessary and should be permitted for concentration and termination equipment. No similar justification exists for collocating switches, enhanced services equipment and customer premises equipment. Thus, to the extent the FCC's "used or useful" test may be viewed as broader than GTE's position or may be argued in the future to require collocation of additional or different equipment than that described above, GTE submits that such a construction would be contradicted by the Act

itself. In any case, the FCC left to State commissions the determination whether particular equipment not discussed in the Order is entitled to collocation. (Order at ¶ 581.)

**Q. SHOULD AT&T BE PERMITTED TO COLLOCATE AT ANY AND ALL OF GTE'S BUILDINGS AND STRUCTURES?**

A. No. AT&T believes that it should be permitted to collocate its equipment at any GTE location it chooses, including vaults and remote units. Again, AT&T's collocation position is not limited to what is necessary for interconnection and fails to consider space limitations. Many of GTE's buildings and structures are very small and house network elements that do not perform routing or rating functions. Therefore, interconnection and collocation at many of those points offers few benefits that cannot be obtained by collocating either at a central office (where calls are routed to and from customers), a serving wire center (the office closest to an interexchange carrier's point of presence which serves as a rating point, but provides no switching), or a tandem switch (which routes calls from one central office to another). These latter facilities offer much greater space, the proper environmental conditions, and allow more efficient maintenance and repair of equipment.

**Q. SHOULD COLLOCATION BE PERMITTED AT REMOTE UNITS?**

A. Remote units, which are smaller structures housing certain network elements located some distance away from the central office, must

be evaluated on an ad hoc basis. GTE maintains two types of remote units. Remote switching units ("RSUs") have some independent switching capability and may direct local transmission traffic within a particular area. Remote line units ("RLUs"), by contrast, contain no such independent capability. RLUs interact with the switch at the central office, which acts as the host computer, directing transmission traffic. (Host switches and RLUs often share NXX codes, making it impossible to route terminating traffice to a RLU.) Many remote units also lack "rating" capability--the ability to measure and record traffic flow data for billing and other purposes.

Remote units are very small and offer very little space to accommodate collocators. The cramped confines of these facilities also make it difficult to segregate adequately different companies' equipment and to limit third-party access. Consequently, few, if any, ALECs will be able to place equipment in these structures. Since "dumb" remote units, such as RLUs, offer no significant benefits over central offices, serving wire centers and tandem switches (which contain routing and switching functions, have greater space, and offer the proper environmental conditions), GTE believes that collocation should not be permitted at such locations. For the same reasons, GTE opposes collocation at vaults and manholes which also have very limited space and which, like RLUs, house no routing or rating equipment.

GTE recognizes that the FCC's Order requires collocation to be provided at all structures that house GTE network facilities, including "any structures that house LEC network facilities on public rights-of-way, such as vaults containing loop concentrators or similar structures." (Order at ¶¶ 573-75.) I have been advised by GTE's lawyers, however, that such an expansion of the FCC's earlier collocation requirements is unauthorized under the Telecommunications Act and, hence, outside the FCC's power. (See Bell Atlantic, cited earlier, 24 F.3d at 1441; see also GTE's Takings Report, detailing 5th Amendment considerations). To the extent the Commission deems itself to be bound by the FCC's holding in this regard, GTE would be willing, pending judicial review of the FCC's determination, to provide collocation at such structures to the extent space is available, the interconnection requested is technically feasible, security concerns can be adequately addressed, and the collocator bears the costs of the collocation arrangement.

Collocation at RSUs or remote units that offer independent routing or rating capability do provide greater interconnection benefits, but they too suffer from severe space limitations. Nonetheless, because RSUs contain some unique network functions, GTE will provide collocation at these sites where space is available, the requested interconnection is technically feasible, security concerns can be adequately addressed, and the collocator pays all costs of

the collocation arrangement. This position is consistent with the FCC's prior collocation policies. (See Special Access Order at ¶¶ 53-57.)

**Q. SHOULD AT&T BE PERMITTED TO DEMAND VIRTUAL COLLOCATION EVEN WHEN PHYSICAL COLLOCATION IS AVAILABLE?**

A. No. AT&T requests that the Commission mandate virtual collocation as an alternative to physical collocation, even where the latter can be provided. GTE strongly supports virtual collocation and is willing to pursue such arrangements in voluntary negotiations. However, GTE believes that the Act does not allow the Commission to require virtual collocation as an option unless the Commission finds that "physical collocation is not practical for technical reasons or because of space limitations." (Act at 251(c)(6).) I have been advised by GTE's lawyers that virtual collocation involves a "taking" of ILEC property for the benefit of another, and, under the principle of statutory construction applicable to takings enunciated in Bell Atlantic v. FCC, both the FCC and this Commission are bound by the express language and qualifications delineated by Congress. (See Bell Atlantic, 24 F.3d at 1445-46; GTE's Takings Report.) It follows that, where physical collocation can be provided by an ILEC, virtual collocation need not be offered as an option except by mutual agreement.

GTE recognizes that the FCC's Order requires virtual collocation to be provided at the option of the requesting ALEC. (Order at ¶ 551.) As explained above, however, GTE disagrees with the FCC's analysis. Nonetheless, to the extent the Commission deems itself to be bound by the FCC's determination in this regard, GTE would be willing, pending judicial review of the FCC's decision, to provide virtual collocation to the extent space is available, the requested interconnection is technically feasible, and the collocator pays all costs of the virtual collocation arrangement.

**Q. SHOULD GTE BE PERMITTED TO IMPLEMENT REASONABLE SAFETY AND SECURITY MEASURES TO PROTECT ITS SYSTEMS?**

A. Yes. Collocating two competitors in the same facility gives rise to certain unavoidable risks. Under the Act, GTE will be required to permit a third party competitor to have access to its private facilities which house highly sensitive equipment and proprietary information. Similarly, those parties that choose to collocate on GTE property also will have their equipment exposed to third-party access. It is reasonable in this highly unusual situation to establish security measures, such as partitioning areas for collocating parties and installing fencing within the partitioned areas for each collocator. This ensures that no party has access to any other party's equipment. As the FCC has recognized, such measures minimize the risk of harm to the public switched telephone network and are in the best interests of all the parties. (Order at ¶ 598.)

**Q. SHOULD AT&T BE PERMITTED TO CROSS-CONNECT WITH NON-GTE COLLOCATORS ON GTE PROPERTY?**

A. No. AT&T argues that the Act requires GTE to allow collocators on its premises to completely bypass GTE's network and cross-connect with each other. Although nothing in the language of the Act suggests that Congress contemplated such action, the FCC recently has required that, at the option of the ILEC, such cross-connects be made available through ILEC-provided or ALEC-provided facilities. (Order at ¶ 595.) GTE's Legal Department has determined that this requirement works a "taking" of ILEC property in excess of the FCC's authority under the Act under Bell Atlantic v. FCC. (See GTE's Takings Report.)

The Act imposes a duty on ILECs only to interconnect their network elements with a requesting party's collocated equipment. It does not impose a duty to facilitate interconnection between third-parties anywhere, much less on its own premises. In other words, collocation authorized under section 251 only permits third parties to make use of their competitors' private property for the limited purpose of gaining access to critical network elements that are in the ILEC's control. Collocation is not an open invitation for ALECs to use ILEC property for purposes wholly unrelated to the ILECs' network.

Finally, while GTE recognizes that this Commission has ordered

ILECs to allow third-party cross-connections in its Order number PSC-96-0445-FOF-TP, that Order is subject to appeal before the Florida Supreme Court. GTE, therefore, maintains its opposition to such cross-connects.

Nonetheless, should the Commission deem itself bound to follow its own and the FCC's Order pending judicial review, GTE will permit the interconnection via cross-connects of the collocated equipment of different ALECs as long as the provisioning of the cross-connect by GTE or the ALECs shall be at the option of GTE, the connected equipment is used for interconnection with GTE or access to GTE's unbundled network elements, space is available, reasonable security arrangements can be provided, and the ALECs pay all costs associated with the cross-connect.

**Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

A. The Act was passed to introduce competition into the local telephone market. It recognizes that certain functions of the traditional local exchange network cannot be quickly or easily duplicated by new market entrants, and that competing providers will have to be interconnected in order to switch traffic among their customers. Collocation is a limited measure designed to remove technical and market barriers to interconnection and access to network elements. Because state-mandated physical occupation of a company's private property may offend the Constitution,

Congress was careful to limit collocation to equipment "necessary for interconnection." AT&T, however, goes far beyond what is necessary and seeks to collocate wherever and whenever AT&T finds it convenient and advantageous to do so. Accordingly, the Commission should adopt GTE's preferred positions as set out above or, at a minimum, GTE's alternative positions as conditioned herein and subject to judicial review of the FCC's Order.

**Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

A. Yes.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF CHARLES F. BAILEY**

**DOCKET NO. 960847-TP**

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

A. My name is Charles F. Bailey. My business address is 600 Hidden Ridge, Irving, TX, 75038.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations as Senior Product Manager - Network Access Services.

**Q. PLEASE DESCRIBE YOUR EDUCATION AND WORK EXPERIENCE.**

A. I graduated from Texas A & M University in December of 1987 with a Bachelor of Science degree in Electrical Engineering and in December of 1991 I graduated from Southern Methodist University with a Masters degree in Business Administration. I joined Contel of Texas in January 1988 as Associate Engineer and was promoted to Engineer in December of 1989. In August of 1991, I joined GTE Telephone Operations Headquarters as Senior Administrator in Access Pricing and became a Staff Administrator in Access Pricing in September of 1992. In January of 1994 I was promoted to Section Manager - Ancillary Pricing and then in February of 1995 to Section Manager - State Access Pricing.

Finally, in April of 1996, I was named to my current position of Senior Product Manager - Network Access Services.

**Q. WHAT ARE THE RESPONSIBILITIES OF YOUR CURRENT POSITION?**

A. I am responsible for managing various operational and regulatory issues associated with GTE's poles, conduits and rights-of-way, especially as they relate to the Telecommunications Act of 1996. In this proceeding, I am providing testimony on behalf of GTE.

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

**A.** My testimony discusses the open issues between GTE and AT&T with regard to access to GTE's poles, conduits, and rights-of-way. I first provide a brief background regarding the history and nature of GTE's telephone poles, conduits and rights-of-way. Next I give an overview of the relevant provisions of the Telecommunications Act of 1996 ("Act") and describe GTE's position with respect to the constitutional issues raised by the Act. I then list the disputed issues and a summary of the respective positions of the parties. Finally, I elaborate on GTE's positions on the issues in dispute.

**Q. WHAT IS GTE'S GENERAL POSITION ON ACCESS TO ITS POLES, DUCTS, AND CONDUIT IN THIS ARBITRATION?**

A. The Act requires that access to poles, conduits and rights-of-way

be made available to all "cable television systems" and "telecommunications carriers" on a "nondiscriminatory" basis. AT&T takes the position that GTE's poles and conduits are now as accessible as any other property in the public domain. However, GTE maintains that the Act did not divest GTE of its property rights, and as such AT&T's rights to GTE's poles and conduits necessarily must be subject to certain limitations.

**Q. PLEASE TELL US SOMETHING ABOUT THE NATURE OF GTE'S POLES AND CONDUITS.**

A. In the 28 states in which it operates, GTE owns thousands of telephone poles ("poles") and hundreds of miles of underground conduits ("conduits"). The poles and conduits--which have been placed across public and private property over the span of several decades--facilitate the provision of telecommunication service to GTE's end-user customers through the linking of transmission equipment between GTE's network and the customer's physical location. Facilities placed on poles or in conduits range from basic twisted pair copper wires to fiber optic cables.

Because of the significant investments in time, cost and effort required to place new poles and conduits, GTE must be sure to satisfy both its current needs as well its future space requirements. GTE forecasts its future space requirements on the basis of a five-year horizon. The need to anticipate future

demand is particularly important with respect to conduits. Access to conduits requires GTE to excavate the public infrastructure, such as streets and roadways, after obtaining all necessary authorizations from public authorities--a long and sometimes troublesome process. The capital investment associated with the ongoing placement of poles and conduits is paid by GTE.

Once poles and conduits have been placed, GTE is responsible for using and maintaining them in a safe manner. This means, for example, that GTE must replace a pole if that pole is no longer able to support the facilities placed on it; that GTE must repair any of its poles that are downed for any reason (typically on an expedited basis); that GTE must repair conduits damaged by natural catastrophe or negligent acts of excavators; and that GTE must comply with all applicable safety standards such as those of the National Electric Safety Code and the Occupational Safety and Health Act.

**Q. DO COMPANIES OTHER THAN GTE USE ITS POLES AND CONDUITS?**

A. Yes. In addition to policing its own activities in connection with its poles and conduits, GTE also must concern itself with outside companies that are authorized to place their own facilities on GTE's poles and in its conduits. Historically, companies receiving such authorization have been limited, with very rare exceptions,

to cable television ("CATV") companies. Since the early 1970s, GTE has allowed CATV companies access to its poles and in its conduits pursuant to private agreements. In the absence of such an agreement, or in a case involving a dispute over the rates, terms or conditions of access, parties may seek state--where it has exercised jurisdiction over attachments--or federal intervention under section 224 of the Act.

**Q. DO THESE OTHER COMPANIES SHARE RESPONSIBILITY FOR THE POLES AND CONDUITS?**

A. No. Despite the addition of CATV facilities to GTE's poles and conduits, GTE has retained sole responsibility for all of the burdens of ownership. GTE must still repair or replace a downed pole; must still excavate and repair conduit that is struck and damaged; must still ensure the safe use of its poles and conduits; and must still respond and defend against all claims against it for personal injury or property damage involving its poles and conduits.

**Q. HOW ARE RIGHTS-OF-WAY RELATED TO POLES AND CONDUITS?**

A. Before GTE can place any pole or conduit at any location, it must first obtain all rights-of-way necessary to traverse its facilities across public and private property. In the past, public rights-of-way have been available to GTE, as a public utility, free of

charge. More recently, however, a growing number of state and local municipalities have begun exploring ways in which to assess a levy as compensation, such as a "donation" of telecommunications equipment, for the use of their rights-of-way. For example, the Virginia Department of Transportation ("VDOT") has implemented a "resource sharing" policy that, in effect, establishes a quid pro quo for companies requesting authorization to place underground cables. In one instance, VDOT apparently demanded dedicated fiber optic cable from Bell Atlantic in exchange for authorization to place 7300 feet of fiber optic cable underground.

Private rights-of-way, some in the form of formal easements, must be obtained by GTE from private property owners. The consideration paid for private rights-of-way varies and can be significant in some instances. Similarly, the specific rights and limitations of each right-of-way vary.

**Q. HOW DOES THE ACT CHANGE THE FORMER LAW WITH REGARD TO REGULATORY OVERSIGHT OF ACCESS TO POLES, CONDUITS, AND RIGHTS-OF-WAY?**

A. The Act revised section 224 of the Communications Act of 1934 in a number of significant ways. The most important change relating to section 224, however, is the provision of "nondiscriminatory" access to poles, conduits and rights-of-way

to be made available to all "cable television systems" and "telecommunications carriers." (Act at § 224(f)(1).). Prior to the Act, section 224 did not require that such access be made available. Rather, it was used by the FCC to determine whether agreements voluntarily entered into between facilities owners and cable television companies contained rates, terms and conditions that were "just and reasonable." Even this level of regulatory intrusion did not occur unless the matter was presented formally to the FCC by an involved party. In fact, it would be accurate to say that the vast majority of pole and conduit access agreements existing prior to the Act have never been subject to regulatory review.

As a general matter, it is GTE's position that the Act's requirement that utilities grant access to their facilities constitutes a taking of private property for public use without just compensation. GTE's takings analysis is set forth in more detail in its Takings Report, attached to its Response to AT&T's Arbitration Petition. In brief, however, I am told by GTE's lawyers that, prior to the Act, section 224 was determined to pass constitutional muster by the U.S. Supreme Court expressly because it did not require that access be granted. Rather, it merely authorized the FCC to review the rents charged by public utility landlords who had voluntarily entered into leases with cable company tenants. The Court made it clear, however, that if

section 224 mandated access, it would constitute a taking in violation of the Fifth Amendment.

The FCC unequivocally concluded in a recent pronouncement on the takings issues relating to the revised section 224 that incumbent local exchange carriers ("ILECs"), such as GTE, can no longer even reserve space on their own poles or in their own conduits for future use. (Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket No. 96-98, FCC 96-325 (released Aug. 8, 1996)("Order") at ¶ 1170.)

**Q. PLEASE LIST THE ISSUES AND POSITIONS OF THE PARTIES IN THIS ARBITRATION.**

A. Despite GTE's conviction that section 224's access requirements are consitutionally infirm, the Company has continued to negotiate access arrangements with AT&T. Virtually every issue that remains unresolved flows from the basic conflict between GTE's attempt to exercise reasonably its basic ownership rights and AT&T's apparent belief that GTE's poles and conduits are now as accessible as any other property in the public domain. The remaining unresolved issues present the following questions:

(1) *Can access to poles and conduits be denied for reasons of capacity, safety, reliability and generally applicable engineering purposes?*

**AT&T's Position:** Section 224(f)(2) allows only "a utility providing electric service" to deny access on these grounds.

**GTE's Position:** It defies logic to allow only electric utilities to deny access on these grounds. If access should be denied on one of these grounds, that denial should not turn on the type of service provided by the owner of the facility.

(2) *Does the term "rights-of-way," as used in section 224, include all possible pathways to the end-user customer?*

**AT&T's Position:** AT&T must be allowed access to all possible "pathways" to its customers, including entrance facilities, cable vaults, equipment rooms and telephone closets, all of which fall under the term "rights-of-way" in section 224.

**GTE's Position:** Such "pathways" are not, and never have been, included in the term "rights-of-way." Accordingly, access to "pathways" is not required by section 224.

(3) *Does an entity obtaining access to a utility's conduits have the unfettered right to "break out" of that utility's manholes?*

**AT&T's Position:** AT&T must be allowed to "break out" of GTE's manholes whenever necessary to route its facilities.

**GTE's Position:** AT&T must obtain prior authorization from GTE before breaking out any GTE manhole. GTE must ensure that the structural and operational integrity of its manholes are maintained.

(4) *Can a utility reserve space on its poles and in its conduits for future use?*

**AT&T's Position:** Because no other entity can reserve space for future use and because GTE must provide access on a nondiscriminatory basis, GTE cannot reserve space for its future use because it would be discriminating in favor of itself.

**GTE's Position:** A basic right of ownership is the ability to use your own property. If GTE cannot reserve space, its rights of ownership will be reduced to that of a mere licensee.

Below, I elaborate on GTE's positions on these disputed issues.

**Q. DOES THE ACT PERMIT GTE TO DENY ACCESS TO ITS POLES, CONDUITS, OR RIGHTS-OF-WAY FOR ANY REASON?**

A. Section 224(f)(2) permits "a utility providing electric service" to deny access to its poles, conduits or rights-of-way if there "is insufficient capacity and for reasons of safety, reliability and generally applicable engineering purposes." In its recent Order, the FCC determined that "any utility may take into account issues of capacity, safety, reliability and engineering when considering attachment requests, provided such assessment is done in a nondiscriminatory manner." (Order at ¶ 1176.) The FCC added, however, that a denial on any one of these bases "will be scrutinized very carefully, particularly when the parties concerned have a competitive relationship." (Order at ¶ 1177.)

**Q. DOES THE ACT CONFER ON AT&T A RIGHT OF ACCESS TO ALL POSSIBLE "PATHWAYS" TO END USER CUSTOMERS?**

A. No. There is no evidence that Congress intended to expand the meaning of the term "right-of-way," as used in section 224, to include all possible "pathways" to the end-user customer such as entrance facilities, cable vaults, equipment rooms and telephone closets. The meaning of "right-of-way" has never been formally defined for purposes of section 224. GTE's lawyers tell me, however, that the term right-of-way has always referred to the

legal right of a utility to place poles or conduits across public or private property. A formal definition has never been needed because, prior to the passage of the Act, section 224 only applied to CATV companies--entities that had no need for a telephone company's entrance facilities, cable vaults, equipment rooms and telephone closets.

**Q. DOES THE FCC'S ORDER SUPPORT GTE'S POSITION ON THE PATHWAY ISSUE?**

A. Yes. In its Order, the FCC noted that "some commenters" (i.e., AT&T) had favored a broad interpretation of "pole, duct, conduit, or right-of-way" in order to "minimize the risk that a 'pathway' vital to competition could be shut off to new competitors." (Order at ¶ 1185.) The FCC first acknowledged that an "overly broad" interpretation could affect owners and managers of small buildings, as well as ILECs, "by requiring additional resources to effectively control and monitor such rights-of-way located on their properties." (Order at ¶ 1185.) After rejecting a claim that section 224(f)(1) required access to the roof of a utility's corporate offices for the installation of a transmission tower, the FCC concluded:

> [t]he intent of Congress in section 224(f) was to permit cable operators and telecommunications carriers to "piggyback" along distribution networks owned or controlled by utilities, as opposed to

granting access to every piece of equipment or real property owned or controlled by the utility.

(Order at ¶ 1185 (emphasis added)(footnote omitted).)

Had the FCC intended to adopt AT&T's expansive interpretation of "rights-of-way" to include all possible "pathways" to the end-user customer, it would have done so. Instead, it clarified the scope of section 224(f)(1) by limiting it to an entity's ability to "'piggyback' along distribution networks" to the extent they "are owned or controlled by utilities." (Order at ¶ 1185 (emphasis added).)

**Q. ARE THE PATHWAYS AT&T REFERS TO PART OF GTE'S NETWORK, SUCH THAT ONLY GTE CAN GRANT ACCESS TO THEM?**

A. No. The areas identified by AT&T as "pathways" are not part of the distribution network used to place GTE's facilities. Rather, they are the linking point between GTE's facilities and the customer's premises equipment. These "pathways" generally are not owned or controlled by GTE. GTE is able to place its equipment in these areas through arrangements negotiated with the premises owners. There is nothing to prevent AT&T from making its own arrangements. In this regard, GTE has represented that it will not discourage property owners from agreeing to similar arrangements with AT&T, nor will GTE enter

into agreements that in any way restrict the owner's ability to grant such access to AT&T.

**Q. SHOULD AT&T HAVE THE UNRESTRICTED RIGHT TO "BREAK OUT" OF MANHOLES ONCE GTE HAS GRANTED IT A CONDUIT ACCESS ARRANGEMENT?**

A. "Breaking out" of manholes refers to the process by which new holes are placed through the walls of manholes to provide an entrance or exit for underground cables. GTE has proposed that any company desiring to break out of a GTE manhole first should obtain authorization from GTE. In determining whether authorization should be granted, GTE would need to address at least two issues. First, GTE would have to determine whether or not the desired hole would impair the structural and operational integrity of the manhole. Only a limited number of holes can be made in a manhole wall (typically six to eight inches of concrete) before that wall becomes structurally unsound. This requirement would be consistent with the safety concerns underlying the FCC's determination that access can be denied by any utility for reasons of capacity, safety, reliability and engineering. (See Order at ¶ 1176.)

Second, depending on the extent of the effort required to make the desired hole, GTE may be required to ensure that all work is performed by qualified individuals in a safe, workmanlike manner.

Breaking out of a manhole typically involves the use of heavy equipment, such as a jack hammer, which can cause severe damage if not used properly. Moreover, facilities in a manhole must be properly installed, grounded and bonded to avoid future damage. Thus, such a provision would be consistent with the FCC's determination that utilities can require that "only properly trained persons" work in the proximity of their facilities. (Order at ¶ 1182.)

**Q. SHOULD GTE BE ALLOWED TO RESERVE ANY SPACE ON ITS POLES AND IN ITS CONDUITS FOR ITS OWN FUTURE NEEDS?**

A. Yes. The Act's requirement of "nondiscriminatory access" does not mean that GTE's rights as an owner of poles and conduits must be relegated to the status of a mere licensee occupant. Rather, "nondiscriminatory access" requires that an owner of poles or conduits treat equally all companies seeking access. Thus, for example, an owner would not be permitted to provide access to a subsidiary or affiliate on terms and conditions more favorable than those offered to all other companies. It also means that an owner would not be allowed to place more onerous terms and conditions for access on a competitor than are imposed on non-competing company.

As a public policy matter, ILECs, such as GTE, have special service obligations by virtue of their status as providers of last

resort. Because GTE must be able to serve new customers readily, it must always have reserve capacity. Depriving GTE of the ability to maintain reserve capacity would impair service to the public and cause extraordinary cost increases. Moreover, depriving GTE of the ability to reserve space on its own facilities will have a significant adverse effect on GTE's future investment in poles and conduits. If GTE cannot reserve space in its own facilities, there is no incentive to construct facilities sufficient to satisfy future needs. As a result, economic and efficient investment will be lost, and long-range strategic planning rendered impossible.

Finally, a determination precluding GTE from reserving space for its own future needs is squarely at odds with the plain meaning of section 224(f)(1), which applies the nondiscrimination requirement only to those for whom access must be "provided," not to the owner, whose "access" is synonymous with its ownership right.

**Q. BASED ON YOUR COMMENTS, IT SEEMS GTE DOES NOT AGREE WITH THE FCC'S INTERPRETATION OF THE ACT IN THIS RESPECT. IS THAT CORRECT?**

A. For the reasons I discussed above, GTE does not agree with the FCC's conclusion that non-electric utilities, such as GTE, are not permitted to reserve space on their own facilities under the

nondiscriminatory access requirement of section 224. GTE's legal advisors believe that the FCC's conclusion, coupled with the access rate requirements of section 224 and the FCC's implementing regulations, effect a "taking" of GTE's property in violation of the Fifth Amendment of the U.S. Constitution. The takings issue is treated in detail in GTE's Takings Report, which I mentioned earlier, and this legal issue will also be discussed in the Company's post-hearing brief.

**Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

A. Should the Commission choose to follow the Act and the FCC's implementing regulations pending judicial review, the Commission nevertheless should recognize GTE's vested property rights and limit AT&T's access to GTE's poles, conduits and rights-of-way accordingly. Specifically, GTE asks that the Commission: (1) permit GTE to deny access to AT&T under certain situations of insufficient capacity and/or reasons of safety, reliability and generally applicable engineering purposes; (2) adopt GTE's definition of "pathways"; (3) place restrictions on AT&T's ability to break out of GTE's manholes, requiring AT&T to obtain prior approval, and (4) reserve space on its poles and conduits for future use.

**Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

A. Yes.

**GTE FLORIDA INCORPORATED**

**TESTIMONY OF DOUGLAS E. WELLEMEYER**

**DOCKET NO. 960847-TP**

## I. Introduction

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

A. My name is Douglas E. Wellemeyer. My business address is 4100 North Roxboro Road, Durham, North Carolina.

**Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

A. I am employed by GTE Telephone Operations, as Manager - South Area Pricing and Tariffs. I am providing testimony in this proceeding on behalf of GTE Florida (GTE or the Company).

**Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE IN THE TELECOMMUNICATIONS INDUSTRY.**

A. I graduated from Duke University, Durham, North Carolina in 1976 with a Bachelor of Science degree in Engineering. During 1978 I began graduate study, and in 1980 earned a Master's Degree in Business Administration, also from Duke.

I was employed by General Telephone Company of the Southeast, now GTE South, in 1976 and held various positions in the Network Engineering organization. In 1983, I was named Staff Manager - Network Program Management with GTE Service

Corporation in Stamford, Connecticut, and in 1985 I was reassigned to the position of Staff Manager - Separations and Access Costs in Irving, Texas. In both positions, my responsibilities involved development and administration of separations and access cost study procedures used by the domestic GTE telephone operating companies.

In May 1987, I was named Pricing and Tariffs Manager for GTE South, responsible for the development of rates for all products and services offered under tariff, and for preparing and executing GTE South's tariff filings as required by the various state regulatory commissions. In January 1989, I was named Manager - Separations and Access Costs for GTE Telephone Operations, with responsibility for the development of jurisdictional separations and access cost studies in accordance with applicable Federal Communications Commission (FCC) Rules and Regulations, and for the preparation of jurisdictional and access service cost support for various intrastate compensation arrangements and tariff filings in GTE's South Area states. I assumed the responsibilities of my current position in January, 1993.

**Q. WHAT ARE THE RESPONSIBILITIES OF YOUR CURRENT POSITION?**

A. As Manager - South Area Pricing and Tariffs, I am responsible for

the development and implementation of pricing and costing policy and procedures; the design of corresponding price structures for toll and local network service offerings; and the design and execution of cost studies necessary to support certain pricing proposals. I am also responsible for filing tariffs for these services, as well as the intrastate access service tariffs, according to state commission rules and regulations.

I am responsible for these activities in Alabama, Florida, Kentucky, North Carolina, South Carolina and Virginia, and in other states as the need may arise from time to time.

**Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE OTHER REGULATORY COMMISSIONS?**

A. Yes. I have appeared before the state regulatory commissions in Florida, Georgia, Kentucky, North Carolina, South Carolina and West Virginia.

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

A. My testimony addresses the development of GTE's proposed wholesale prices for all services offered for resale. In my testimony, I offer and explain two avoided cost studies prepared by GTE in support of the proposed prices. Both GTE studies produce avoided cost results that are significantly lower than

AT&T's proposed avoided cost discount and the FCC's avoided cost discount rates.

The first study is GTE's Avoided Cost Study, where GTE's proposed prices are calculated as the price of the retail offering less costs avoided when service is offered through wholesale, rather than retail, distribution channels. My testimony describes the methodology and results of GTE's analysis of avoided costs.

The second study is a modification of the ARMIS-based avoided cost analysis conducted by MCI, upon which the FCC relied, in part, to establish its default avoided cost discount range. Based on analysis of actual "direct expenses" (i.e., marketing and customer service expenses), GTE has modified the ARMIS model to reflect all costs that can reasonably be expected to be avoided in a manner that conforms with the FCC's proposed avoided cost study criteria. GTE believes that its Avoided Cost Study best reflects the intent of the Act, and offers this Modified Avoided Cost Study based on an ARMIS model as an alternative for use only if the FCC's rules on avoided cost are held to be lawful. Nevertheless, the Modified Avoided Cost Study clearly shows that both the AT&T proposal and the FCC's avoided cost discount for GTE are artificially high and economically burdensome.

Finally, my testimony addresses GTE's positions on various issues related to resale offerings and restrictions.

**Q. HOW IS YOUR TESTIMONY ORGANIZED?**

A. Section II of my testimony discusses GTE's methodology for determining avoided retail costs, and discusses the application of that methodology in the GTE Avoided Cost Study. Section III discusses GTE's methodology for determining avoided retail costs under the Modified Avoided Cost study using an ARMIS-based model. Section IV compares the results of the GTE Avoided Cost Study and the Modified Avoided Cost Study to AT&T's proposal and to the FCC's rate of 18.81% for GTE overall. Section V addresses the resale issues.

**Q. WHY DID GTE PERFORM AVOIDED COST STUDIES?**

A. The Telecommunications Act of 1996 (the Act) states that it is the duty of each incumbent local exchange carrier (ILEC) "to offer for resale at wholesale rates any telecommunications service that the carrier provides at retail to subscribers who are not telecommunications carriers" ( 47 U.S.C. § 251(c)(4) (1996)). The Act further states that for this purpose "a State commission shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided

by the local exchange carrier" ( 47 U.S.C. § 252(d)(3) (1996)). To comply with the requirements of the Act, it is necessary to determine avoided retail costs to establish the required wholesale rates for services offered for resale. GTE's Avoided Cost Study was conducted for this purpose.

In addition, the FCC's First Report and Order in CC Docket No. 96-98, released August 8, 1996, provided for the addition of Part 51 Rules governing local interconnection. Subpart G of these Rules defines specific avoided cost study requirements and criteria. GTE prepared its Modified Avoided Cost Studies in conformance with Part 51 Rules, for use if the Rules are determined to be lawful.

**Q. PLEASE SUMMARIZE THE RESULTS OF GTE'S AVOIDED COST STUDY AND THE MODIFIED AVOIDED COST STUDY, AND COMPARE THESE RESULTS TO AT&T'S PROPOSAL AND TO THE FCC'S DISCOUNT RATE FOR GTE OF 18.81%.**

A. GTE's Avoided Cost Study analyzes avoided costs separately for each of five major service categories. The avoided costs for residential services are $0.83 per line per month; avoided costs for business services are $1.06 per line per month. Since the amount of the avoided costs per line is the same for all rate groups, the effective discount rate varies by rate group. For

example, if the monthly residential line rate in a given rate group is $10.00, the avoided cost discount is $0.83, or 8.3%.

For the remaining service categories, the avoided cost discount rates are as follows:

| | |
|---|---|
| Usage Services | 7.1% |
| Vertical Services: | |
| Business | 5.5% |
| Residence | 6.6% |
| Combined | 6.2% |
| Advanced Services | 15.3% |

The Modified Avoided Cost Study determines a single discount rate for each tariff entity. Each single rate is appropriate for application to all retail services offered for resale. The avoided cost discount rates calculated using the ARMIS-based model is as follows:

| | |
|---|---|
| GTE Florida | 11.25% |

In all cases, the rates calculated by GTE are lower than the FCC's default avoided cost discount rates, and differ significantly from AT&T's suggested 30.9% discount rate.

## II. GTE's Avoided Cost Study

**Q. HOW ARE AVOIDED COSTS DEFINED FOR THE PURPOSES OF THE GTE AVOIDED COST STUDY?**

A. Avoided retail costs are defined as the difference in total costs with and without the offering of service for resale, i.e., the costs avoided when a service is offered through wholesale, rather than retail, distribution channels.

**Q. WHAT IS THE BASIS FOR THIS DEFINITION OF AVOIDED COSTS?**

A. This definition is consistent with the Act, and properly positions wholesale prices for competitive markets. Setting wholesale prices too high could result in undercutting the ability of resellers to recover a sufficient retail mark up to allow for a viable resale market. On the other hand, if the adjustment for avoided retail costs is too large, the ILECs will not be compensated for their true costs. Moreover, facilities-based alternative local exchange carriers (ALECs) could be placed at a competitive disadvantage in pricing their retail service if ALEC resellers are able to purchase wholesale local exchange services below its cost. Finally, appropriately-set wholesale prices will encourage facilities-based competition.

GTE's definition of avoided costs also recognizes the inescapable fact that while some retail costs are avoided for certain activities, a similar activity is often required to offer the same service on a

wholesale basis for resale. For example, some incremental retail customer billing activities may be avoided when the service is offered instead for resale, but a wholesale billing function must still be performed. The avoided billing cost is, logically, the difference between the costs of these two activities.

**Q. BASED ON THIS DEFINITION, WOULD YOU PLEASE DEFINE THE COMPONENTS OF AVOIDED RETAIL COSTS AS USED IN THE AVOIDED COST STUDY?**

A. Yes. When a retail service is offered instead on a wholesale basis for resale, the resulting avoided costs can be separated into two components. First, total costs are decreased because it is no longer necessary to provide some incremental retailing functions in support of the service. Second, total costs are increased to the extent that it becomes necessary to provide substitute wholesaling functions in support of the resale service.

Therefore, avoided retail costs are equal to: (1) costs associated with displaced retail activities (affected retail costs) minus (2) added costs associated with replacement wholesale activities (substitute resale costs).

**Q. HOW WAS THE FIRST COMPONENT OF AVOIDED COSTS, THE AFFECTED RETAIL COSTS, QUANTIFIED IN THE AVOIDED COST STUDY?**

A. The first component of avoided costs was calculated by examining all activities involved in the provision of retail services, and identifying the cost of performing those activities that are affected when services are provided on a wholesale, rather than a retail, basis (affected costs). Some activities are required regardless of whether the service is offered on a retail or a wholesale basis, so the associated costs would be unaffected when service is provided on a wholesale, rather than a retail, basis (unaffected costs). These activities were ignored in the Avoided Cost Study, since none of the associated costs will be avoided.

For example, in the Avoided Cost Study, the total costs of affected activities required to provide residential services were calculated to be $1.36 per line per month. This amount for the first component represents the decrease in total costs when a residential basic service is offered on a wholesale basis.

**Q. HOW WAS THE SECOND COMPONENT OF AVOIDED COSTS, THE SUBSTITUTE RESALE COSTS, QUANTIFIED IN THE AVOIDED COST STUDY?**

A. The second component of avoided costs was calculated by first identifying existing wholesale services similar in nature to those in each of the retail service categories. Then, using these services as a proxy for the new wholesale distribution channel,

the cost of substitute wholesale activities required when services are offered on a wholesale, rather than a retail, basis was analyzed.

For example, the cost of substitute activities for the residential services category was assumed to be the same as the cost of the same activities currently performed in providing wholesale special access service to interexchange carrier customers. In the Avoided Cost Study, the total costs of affected activities required to provide special access services were calculated to be $0.53 per line per month. This amount for the second component represents the increase in total costs when a residential basic service is offered on a wholesale basis.

**Q. USING THESE TWO COMPONENTS, HOW ARE THE AVOIDED COSTS CALCULATED FOR YOUR RESIDENTIAL SERVICES EXAMPLE?**

A. Avoided costs are calculated as the first component, affected retail costs, less the second component, substitute resale costs. In the Avoided Cost Study, the costs avoided when residential service is provided on a wholesale basis were calculated as $1.36 minus $0.53, or $0.83 per line per month.

**Q. WHAT DATA WERE USED TO CONDUCT THE AVOIDED COST STUDY?**

A. The Avoided Cost Study was based on actual annual results for GTE Telephone Operations's total domestic telephone operations for 1995. The data are reported in a managerial accounting framework reflecting the results of the business as it is managed, rather than according to traditional financial accounting rules.

**Q. WHY WERE RESULTS FOR GTE'S TOTAL DOMESTIC OPERATIONS USED, RATHER THAN RESULTS SPECIFIC TO THIS STATE?**

A. The necessary data are not recorded on a state specific basis, so data specific to operations in this state are not available from GTE's records. This is because the vast majority of the affected activities are performed on a centralized basis from regional and national service centers located throughout the country. Each of these centers handles one or more specific retailing functions for a number of different states.

For example, the National Customer Contact Support Center located in Tampa, Florida provides nationwide support for the customer contact centers by clearing order entry exceptions and processing customer correspondence. A complete listing and description of these centralized functions is provided as Attachment II (Workcenter Glossary) of the Avoided Cost Study. Because the functions are organized and managed in this way, the associated costs for all affected activities taken together are

not meaningful at other than a total GTE Telephone Operations level.

**Q. HOW WERE AFFECTED RETAIL COSTS QUANTIFIED IN THE AVOIDED COST STUDY?**

A. In order to identify the retail costs affected by the offering of services through wholesale rather than retail distribution channels, all of GTE's workcenters were examined to determine which activities would be affected. Resale of existing retail services is defined as the sale of services to a reseller for sale to its end user customers, without any change in the nature of the product by the reseller. Thus, changes in workcenter costs that result from offering services on a wholesale, rather than a retail, basis arise solely from activities associated with the distribution of services, and not from production activities.

**Q. WOULD YOU PLEASE DEFINE THE TERM "WORKCENTER?"**

A. A workcenter is defined as a collection of activities that exhibit: (1) common functions; (2) a common unit measure of demand; (3) a common unit measure of resource consumption; (4) a common geographic uniqueness; and/or (5) a common management structure. Most of the workcenters are defined based on common functions or work activities.

For example, the National Customer Contact Support Center I mentioned earlier performs two specific activities in support of the Customer Contact Centers, clearing order entry errors and processing customer correspondence. These off-line customer contact support functions are organized as a workcenter.

**Q. WERE THE WORKCENTERS ORGANIZED IN A PARTICULAR MANNER SO THAT THE AFFECTED WORKCENTER ACTIVITIES COULD BE IDENTIFIED?**

A. Yes. In general, the affected workcenters are uniquely associated with one of the three lines of business organizations within GTE Telephone Operations. The three lines of business are Consumer, Business and Carrier. The Consumer line of business organization serves the residence and small business markets; the Business line of business serves the balance of the business market, including national accounts; and the Carrier line of business is responsible for the wholesale relationship with other telecommunications providers (this wholesale relationship currently consists primarily of switched access services, special access services, billing and collection, and operator service agreements).

In addition, as shown in the Workcenter Glossary, workcenters are identified for all Network Operations and Corporate General and Administrative functions. These workcenters were reviewed

as well, but are generally not included in the analysis of affected costs because the functions are required for wholesale and retail service provision alike. Finally, Uncollectibles was defined as a workcenter for the purposes of this analysis, and included as such in the Avoided Cost Study.

Once the affected workcenters were identified for study, the total annual costs were determined from the books and records for each affected workcenter. The workcenter costs include labor costs, support and supervision, data processing, training and other employee-related expenses.

The data processing costs were included net of system development and enhancement costs. Development and enhancement costs are "one-time" costs associated with the design and implementation of systems, and were therefore excluded from the Avoided Cost Study. Likewise, projected development and enhancement costs for systems to support the wholesale distribution channel have also been excluded from the Avoided Cost Study. These costs should be recovered from the ALECs who cause them.

**Q. DID YOU MAKE ANY ADJUSTMENTS TO THE ANNUAL COSTS BY WORKCENTER?**

A. Yes. First of all, the identified workcenter costs were adjusted to

include certain payroll overheads not accounted for by workcenter. These costs include health insurance, payroll taxes and management incentives. These costs are recorded and managed separate from the workcenter costs, but are properly included in the Avoided Cost Study, as they would be affected by the offering of resale services in the same way as the related direct labor costs. These adjustments by workcenter are shown in Attachment I of the Avoided Cost Study.

Also, an adjustment was made to workcenter costs to remove any non-recurring costs associated with service ordering activities. The workcenters affected by this adjustment can be identified from the listing provided in Attachment III of the Avoided Cost Study. These costs were identified separately, and not distributed among the service categories in the Avoided Cost Study. This was done because GTE prepared an independent analysis of service ordering and service connection charges.

**Q. HOW WERE THE WORKCENTER NON-RECURRING COSTS ASSOCIATED WITH SERVICE ORDERING ACTIVITIES SEPARATELY IDENTIFIED?**

A. The identification of these costs is documented in Attachment VI of the Avoided Cost Study. Generally, the calculations were based on workcenter-specific data representing the percentage of a workcenter's activities associated with service orders.

For example, for GTE's Customer Contact Centers, the number of calls for service orders was counted and then multiplied by the average length of a service order call (GTE's Customer Contact Centers accounted for approximately 40 percent of GTE's total costs in workcenters having affected costs associated with consumer services). The resulting total service order time was expressed as a percentage of the total time spent on all calls received by Customer Contact Centers. This percentage was then multiplied by the workcenter's adjusted total costs to obtain NRCs. In this way, $182,924,000 in non-recurring costs was separately identified as part of the workcenter costs for the Customer Contact Center.

Once the non-recurring costs were separately identified, the next step was to assign the remaining workcenter costs to the service categories. The target retail service categories are Residential, Business, Usage, Vertical, Advanced and "Other." The Other category was further divided among Directory, Customer Premises Equipment (CPE), CALC and Other.

**Q. WHAT SERVICES ARE INCLUDED IN THE FIVE TARGET RETAIL SERVICE CATEGORIES?**

A. Residential and Business are simply local residential and business services, respectively. Residential services include both flat rate and measured rate services, while business services include

measured rate services, CentraNet® and PBX. The Usage category includes intraLATA toll, discount calling plans, local measured usage, Zone Usage Measurement (ZUM), and Extended Area Services (EAS). Vertical features include such features as call waiting and last number redial, and are offered to both business and residential customers. The Advanced services category includes such services as ISDN BRI and ISDN PRI, Frame Relay, Digital Channel Service, DS-1, and various other dedicated channel services including private line.

**Q. HOW WERE THE REMAINING RECURRING COSTS ASSIGNED TO THE SPECIFIC CATEGORIES OF RETAIL SERVICES?**

A. For a number of workcenters, sufficient information was available to assign costs directly to specific retail service categories. For example, all the costs of the Calling Card workcenter could be directly assigned to the Usage category. In other cases, sufficient information was available to directly assign only a portion of costs.

**Q. PLEASE DESCRIBE THE ASSIGNMENT DONE FOR OTHER WORKCENTERS.**

A. In each of the following workcenters, complete or partial direct assignments of affected costs were made:

National Credit Management Center (NCMC): Workcenter costs were allocated to services on the basis of each service's share of consumer and business uncollectibles for the services supported by the NCMC.

Business Sales Center (BSC): Non-attributed Business service costs were allocated on the basis of business revenues relative to total revenues and the remainder of costs were distributed on the basis of the 1995 sales quotas for the BSC associated with each remaining service.

Branch Sales, Market Response, Branch Sales Engineering and Business Operations Support: Costs associated with the sale of CPE products were netted out of non-attributable costs based on time studies for each of these workcenters. The remaining costs were then distributed according to the relative size of the 1995 sales quotas for each of these workcenters.

Branch Sales Support: The Branch Sales Support - East (West) workcenter's costs replicated the combined allocation of other East (West) branch service workcenters' costs.

National Accounts: The distribution of non-attributable costs replicated the combined allocation of both East and West branch sales service costs.

Business Data Processing: The distribution of non-attributable costs replicated the combined allocation of all branch sales services, BSC, National Accounts and Business Operations Support Service costs.

National Customer Support Center: Non-attributable costs were allocated according to the relative number of service specific calls received by the workcenter.

**Q. IF SUFFICIENT INFORMATION WAS NOT ALWAYS AVAILABLE TO DIRECTLY ASSIGN THE WORKCENTER'S TOTAL AFFECTED COSTS, HOW WERE THESE COSTS ASSIGNED TO THE SERVICE CATEGORIES?**

A. In such cases, workcenter costs not directly assigned were assigned to the service categories in proportion to the net revenues for the service categories associated with that workcenter. This method of assignment is known as the relative revenue rule [see generally, D. Spulber, Regulation and Markets Ch. 3 (1989)]. Attachment III of the Avoided Cost Study identifies the method of assignment used for each workcenter.

Attachment V, page 1, displays the results of assigning costs for all workcenters to the retail service categories.

**Q. HOW WAS THIS INFORMATION USED TO CALCULATE THE AFFECTED COSTS PER UNIT FOR RETAIL SALES?**

A. The units for each of the retail service categories are shown on page 2 of Attachment V of the Avoided Cost Study. For local residential, local business, and advanced services, avoided costs were divided by the number of lines. For usage, avoided costs were divided by the number of minutes. Per unit affected costs for vertical services were not calculated, because data for the second component of avoided costs, substitute resale costs, are not available. I will discuss this issue later in my testimony in the context of substitute resale costs. The results of these calculations are also shown on Attachment V, page 2.

**Q. WHAT ARE THE PER UNIT AFFECTED COSTS ASSOCIATED WITH RETAIL SALES FOR EACH SERVICE CATEGORY?**

A. The per unit affected retail costs for each retail service category are:

Residential $1.36 per month per line;

Business $1.60 per month per line;

Usage $0.01006 per minute; and

Advanced $4.30 per month per line.

**Q. HOW WAS THE SECOND COMPONENT OF AVOIDED RETAIL COSTS, SUBSTITUTE RESALE COSTS, CALCULATED?**

A. Since retail services have not yet been offered for resale for any length of time, their substitute costs cannot be measured directly. Instead, GTE's substitute costs associated with offering service on a wholesale, rather than a retail, basis were calculated by determining the affected costs of an existing wholesale service similar in nature to the services to be offered at resale.

**Q. WHAT EXISTING WHOLESALE SERVICES WERE USED TO CALCULATE SUBSTITUTE RESALE COSTS?**

A. The offering of local residential, local business, and advanced services for resale was assumed to be analogous to the current wholesale provision of special access service. The wholesale offering of retail usage services was assumed to be analogous to the current provision of originating and terminating switched access.

**Q. WHY DID YOU CHOOSE THESE PARTICULAR EXISTING SERVICES AS PROXIES FOR RESALE SERVICES?**

A. Special and switched access services are existing wholesale services provided through a well-established provisioning process. As such, they constitute GTE's most accurate information on the cost of the wholesale provision of line-based and usage-based services. Special access is a logical choice as a proxy for the

retail line-based service, because it is also line-based. Likewise, switched access is a logical choice as a proxy for all usage services.

**Q. WHAT EXISTING WHOLESALE SERVICE DID YOU USE AS A PROXY FOR THE RESALE OF VERTICAL FEATURES?**

A. GTE was not able to identify an existing wholesale service corresponding to the offering of vertical features for resale. Consequently, an alternative approach, which I will describe later, was used to estimate these substitute resale costs.

**Q. WHAT WAS THE FIRST STEP IN CALCULATING SUBSTITUTE RESALE COSTS?**

A. The workcenters were examined to see which ones were applicable. In the case of substitute resale costs, the affected workcenters are organized within the carrier line of business. A workcenter was included in the Avoided Cost Study if it was part of the wholesale access structure.

Once the workcenters applicable to substitute resale costs were determined, the affected costs were distributed among resale service categories using essentially the same methodology I described earlier for the retail workcenters. Sufficient information was not available to assign costs directly to specific service

categories. Consequently, the relative revenue rule was used to assign costs according to carrier revenues.

The assignment of substitute resale costs for all included workcenters is displayed along with the retail affected costs in Attachment V, page 1. The Access column contains the affected costs of providing originating and terminating switched access, which serves as a proxy for the costs of offering switched services, such as intraLATA toll service, for resale. The Advanced column contains the affected costs relating to both retail and wholesale workcenters.

**Q. HOW WAS THIS INFORMATION USED TO CALCULATE THE SUBSTITUTE COSTS PER UNIT FOR RESALE SALES?**

A. The units for the Advanced and Access wholesale service categories are shown on page 2 of Attachment V of the Avoided Cost Study. The per unit substitute costs of Advanced services were determined by dividing total substitute costs by the corresponding number of lines. Likewise, the per unit substitute costs for access services are calculated by dividing total substitute costs by the corresponding number of minutes.

**Q. WHAT ARE THE PER UNIT RESALE SUBSTITUTE COSTS FOR EACH OF THE TWO PROXY SERVICE CATEGORIES?**

A. The per unit substitute resale costs for each category are:

Access $0.00414 per minute, and

Advanced $0.53 per month per line

**Q. PLEASE EXPLAIN THE DEVELOPMENT OF THE AVOIDED COST RESULTS.**

A. Avoided retail costs are defined as the difference in total costs with and without the offering of service for resale. Thus, avoided retail costs are equivalent to the affected retail costs less the substitute resale costs. Since both of these components were calculated on the same per unit basis, the avoided cost results for each retail service category were simply determined by subtraction. The avoided cost results are:

- GTE's avoided retail costs of providing local residential service for resale are equal to $1.36 (affected retail costs) less $0.53 (substitute resale costs), or $0.83 per line per month.

- GTE's avoided retail costs of providing local business service for resale are equal to $1.60 (affected retail costs) less $0.53 (substitute resale costs), or $1.06 per line per month.

- GTE's avoided retail costs of providing intraLATA toll service for resale are equal to $0.01006 (affected retail

costs) less $0.00414 (substitute resale costs), or $0.00592 per minute.

- GTE's avoided retail costs of providing advanced services for resale are equal to $4.30 (affected retail costs) less $0.53 (substitute resale costs), or $3.77 per line per month.

**Q. HOW WAS THE AVOIDED COST DISCOUNT FOR VERTICAL FEATURES DETERMINED?**

A. Since GTE was unable to identify an existing service whose costs would approximate the cost of providing vertical features, it was not possible to calculate avoided costs for vertical features offered for resale. The best alternative available was to apply avoided cost relationships associated with basic exchange services. Thus, the avoided cost discount rates for residential and business basic exchange service were used to approximate the relative avoided costs for vertical features. Consequently

- the avoided cost discount rate for residential vertical features was set equal to the avoided cost discount of local residential service, 6.6 percent;

- the avoided cost discount rate for business vertical features was set equal to the avoided cost discount of

local business service, 5.5 percent; and

- the avoided cost discount rate for vertical features not segregated in the tariff as either residential or business was set equal to the composite avoided cost discount of local residential and business services, 6.2 percent.

**Q. WHAT WAS THE BASIS FOR THE CALCULATION OF GTE'S PROPOSED WHOLESALE RATES?**

A. I relied on the pricing rules presented in the testimony of GTE witness Dr. Sibley. Generally, the wholesale price for a resale service can be calculated as the retail price for that service less the avoided retail costs.

In the case of basic exchange access services, however, an adjustment to costs should be made to acknowledge the foregone contribution associated with complementary services, such as intraLATA toll service. As explained in Dr. Sibley's testimony, the ALEC reseller is very likely to package and self-provision intraLATA toll with the resold local exchange service, rather than purchase intraLATA toll from GTE for resale. Therefore, the "bundle" of services resold includes not only basic exchange access, but also profitable intraLATA toll.

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**Q. HAVE YOU DONE ANY ANALYSIS TO QUANTIFY THE OPPORTUNITY COST THAT ARISES FROM TOLL CONTRIBUTION LOSSES WHEN BASIC EXCHANGE ACCESS SERVICES ARE PROVIDED BY GTE TO AN ALEC FOR RESALE?**

A. Yes. In performing the analysis, I first determined the average intraLATA toll revenue and minutes for GTE's current retail customers by type of local service. I then calculated the current level of contribution from intraLATA toll service, based on the

cost studies which have been filed by GTE. I then converted the average toll minutes per customer to access minutes, based on the assumption that in a resale scenario the ALEC reseller would self-provision intraLATA toll and pay switched access to GTE instead. Finally, I calculated the level of contribution that would be provided by the substitute access service, again based on the cost studies filed in this docket.

This analysis is summarized in Exhibit No. DEW-1 with this testimony. The resale opportunity cost for each basic exchange access service is calculated as the difference between the current toll margin per line and the access margin per line.

**Q. BASED ON THE PRECEDING DISCUSSION AND ANALYSIS, WHAT ARE YOUR PROPOSED WHOLESALE RATES FOR THE BASIC EXCHANGE ACCESS SERVICES UNDER DISCUSSION?**

A. For all basic local exchange services the proposed wholesale rates should be determined, using the pricing rules proposed by Company witness Sibley and the contribution analysis above, as follows:

(1)the retail price,

less(2) the avoided costs per line from the Avoided Cost Study,

plus(4) toll opportunity cost (toll contribution),

less(5) access opportunity gain (access contribution).

**Q. DR. SIBLEY DISCUSSES TWO EXCEPTIONS THAT MAY AFFECT THE ASSESSMENT OF FOREGONE TOLL CONTRIBUTION UNDER THE RESALE SCENARIO YOU HAVE JUST DISCUSSED. WOULD YOU PLEASE IDENTIFY THEM?**

A. Yes. First, it is possible that an ALEC reseller such as AT&T has self-provided toll service to the end user prior to the time resale was initiated. In this case, GTE would not experience any further foregone toll contribution. Second, the ALEC reseller may not actually self-provision toll service. In this case, GTE would continue to provide intraLATA toll, and again there would be no opportunity loss.

**Q. HAVE YOU ACCOUNTED FOR THESE SITUATIONS IN YOUR ANALYSIS, BOTH OF WHICH WOULD OFFSET GTE'S RESALE OPPORTUNITY LOSSES TO SOME DEGREE?**

A. No, the analysis assumes that the ALEC reseller will self-provide intraLATA toll 100 percent of the time. To properly accommodate these situations, I propose to establish a credit rate equal to the opportunity cost I included in the calculation of the resale price for each basic exchange access service. This "toll provider credit" would be a MRC. Upon certification by the ALEC local reseller that it was the toll provider prior to the authorization of local resale, GTE will apply the toll provider credit rate to the account. Likewise, upon certification that the ALEC local reseller is not also the toll provider for the end user customer, GTE will

apply the same toll provider credit. This procedure is administratively simple for both the ALEC and GTE, and properly addresses both of the exception conditions.

**Q. WOULD THE PROPOSED TOLL PROVIDER CREDIT REMAIN CONSTANT OVER TIME, OR WOULD YOU RECOMMEND THAT IT BE ADJUSTED PERIODICALLY?**

A. The toll provider credit should vary over time with changes in the levels of the underlying toll and access contributions. Inasmuch as local, toll and access rates will be rebalanced over time, the toll provider credit should be adjusted whenever toll and access rates are adjusted. Ultimately, the toll provider credit will be replaced entirely by rebalanced rates for both retail and resale services.

**Q. WHAT RATES DO YOU PROPOSE FOR USAGE RELATED SERVICES, INCLUDING MEASURED LOCAL SERVICE, EAS AND INTRALATA TOLL, AND HOW ARE THEY DEVELOPED?**

A. The Usage services category of the Avoided Cost Study includes all of these services. For this category, the results of the Avoided Cost Study are expressed as a discount rate of 7.1 percent to be applied to the various retail prices. As there are no additional opportunity costs associated with offering these usage services for resale, the proposed rates are based on the retail price less avoided costs.

**Q. WHAT ARE YOUR PROPOSED WHOLESALE RATES FOR VERTICAL FEATURES, INCLUDING VERTICAL SERVICES, CENTRANET® BASIC FEATURE PACKAGES, AND PATS FEATURES, AND HOW ARE THEY DEVELOPED?**

A. The Vertical features category of the Avoided Cost Study includes all of these services. For this category, the results of the Avoided Cost Study are expressed as a set of discount rates to be applied to the respective retail prices:

| | |
|---|---|
| Residential vertical features | 6.6% |
| Business vertical features | 5.5% |
| Composite | 6.2% |

The composite discount rate is applied to vertical feature offerings that are not offered separately in the tariff as either residence or business features. As there are no additional opportunity costs associated with offering vertical features for resale, the proposed rates are based on the retail price less avoided costs.

## III. The Modified Avoided Cost Study

**Q. DID GTE PERFORM ANOTHER TYPE OF AVOIDED COST STUDY?**

A. Yes. GTE's second study is a modification of the MCI avoided cost study, which the FCC relied upon, in part, to calculate its default avoided cost discount range. GTE has modified certain inputs to the ARMIS-based model used in preparing this study to

properly identify avoided costs in accordance with the FCC's proposed avoided cost criteria. As I discussed above, GTE strongly believes that its Avoided Cost Study best reflects the intent of the Act, and offers this Modified Avoided Cost Study as an alternative to be used only if the FCC's rules on avoided costs are held to be lawful.

**Q. PLEASE DESCRIBE THE MCI MODEL, AS EMPLOYED BY THE FCC.**

A. Generally speaking, the MCI model is an ARMIS-based model which has been used by the FCC and others to greatly simplify, in fact oversimplify, the determination of avoided retail expenses. I refer to the model as "ARMIS-based" because it applies avoided cost factors to ARMIS data as filed with the FCC by the LECs according to established reporting requirements.

In the model, both direct and indirect expense allocations are performed. Direct expenses are those marketing and customer service expenses reported in accounts 6611, 6612, 6613, 6621, 6622 and 6623. In its proposed rules, lacking any specific actual study data the FCC designated that expenses in accounts 6621 and 6622 would be presumed 100% avoidable, and expenses in the remaining accounts would be presumed 90% avoidable. These were cast by the FCC as rebuttable assumptions.

Indirect expenses generally include support and overhead expenses, which the FCC found to be presumptively avoidable in the same proportion as direct expenses to total expenses. The model performs the necessary allocations internally, based on the treatment of direct expenses.

**Q. PLEASE IDENTIFY GTE'S MODIFICATIONS TO THE ARMIS-BASED STUDY MODEL.**

A. Three basic modifications were made to data inputs used in GTE's Modified Avoided Cost Study; the model itself was not altered, and GTE believes it conforms, as presented, with the FCC's proposed avoided cost criteria.

The three principal modifications are as follows:

1) GTE developed allocators for direct expenses in the model, based on analysis of actual costs. These allocators are used in place of the FCC's presumptions of either 90% or 100% avoidable for each of the six direct expense accounts. A detailed study proves the validity of GTE's replacement allocators;

;

2) Revenues for services to which the avoided cost discount rate is not to be applied were identified and subtracted from operating revenues to determine the appropriate revenue base for calculating the resale discount rate; and

3) Plant-related expenses, return and taxes were identified as attributable to avoidable land and support assets, and included as avoidable costs. These elements were apparently not included in the FCC's analysis using the MCI model.

**Q. PLEASE DESCRIBE THE DETAILED STUDY USED BY GTE TO DEVELOP THE DIRECT EXPENSE ALLOCATORS INPUT TO THE ARMIS-BASED MODEL.**

A. This study was developed for the purpose of determining an "avoided retail expense" factor to be applied in the ARMIS model to each of the six direct expense accounts. The FCC's preliminary analysis established and applied presumptive factors for this purpose.

The study was based on the same workcenter cost detail used in GTE's Avoided Cost Study. Workcenters were grouped by function to facilitate a determination of activities that could reasonably be expected to be avoided in a resale environment. Generally, the costs for each workcenter were either classified as "all avoided" or "none avoided"; the allocation of "sales" workcenter expenses is the only exception to this general approach. Avoided expenses identified in this way were then summarized by account, and divided by total expenses excluding

"General and Administrative" and "Support" workcenter costs to determine the avoided retail percent by account.

**Q. PLEASE IDENTIFY THE KEY AVOIDED COST ASSUMPTIONS UNDERLYING THIS STUDY, AND GIVE THE RATIONALE FOR EACH.**

A. The key assumptions and rationale inherent in the study are as follows:

1) Carrier Access expenses recorded in account 6623 are not avoided costs, since access services are not offered for resale, and the associated expenses are not included in the retail rates for services that are offered for resale.

2) Public Telephone expenses recorded in account 6623 are not avoided costs because they are similar in nature to expenses in Account 6351 discussed in Paragraph 927 of the FCC's First Order and Report. The FCC states that these expenses are not avoided because "they are unrelated to the retail services being discounted". The FCC further explains that it "would not expect these expenses to be included in retail service rates for resold services; but if these expenses were included in retail rates, they would not be avoided when the services are purchased by resellers."

3) Service ordering costs recorded in account 6623 are not avoided costs, because ordering activities will still be required to provide retail services to ALECs for resale. Services will be ordered by ALECs in virtually the same manner as retail services are presently ordered by end user customers. Any efficiencies attributable to the wholesale nature of the ordering process will be nominal, and are offset at least in part by additional ordering activities required as part of the wholesale ordering process.

4) Operator services expenses are not avoided, since there are separate tariff rates for operator services (i.e., the services are offered on an unbundled basis today), and the associated expenses are not included in the rates for other retail services offered for resale. The FCC erred when they allowed that operator services expense avoidance was somehow dependent upon whether an ALEC uses their own operators; in fact, this option has nothing to do with avoided costs. The only relevant issue with respect to avoided costs is the difference in cost between retail and wholesale offerings; in the case of operator services, there is none; the offerings are provisioned, recorded and billed in the same way.

5) Product Management expenses are not avoided, since product planning, product development and product rollout activities, which account for the preponderance of expenses recorded in this account, are required regardless of whether the products are offered at retail or wholesale. This assertion is further proven simply by observing that the reseller incurs none of these types of expenses, and so to the extent that product planning, development and introduction occurs, the associated costs will continue to be borne by GTE and will not be avoided.

**Q. WHAT IS THE AVOIDED COST DISCOUNT RATE INDICATED BY GTE'S MODIFIED AVOIDED COST STUDY?**

A. The avoided cost discount rates calculated using the ARMIS-based model is as follows:

GTE Florida 11.25%

## IV. Comparison of Results

**Q. HAVE YOU PREPARED A COMPARISON OF THE RESULTS OF GTE'S STUDIES WITH AT&T'S PROPOSAL AND THE FCC'S AVOIDED DISCOUNT RATE FOR GTE OVERALL?**

A. Yes. For the purposes of this comparison, GTE's Avoided Cost Study results by service category are composited together into one discount factor (GTE's study results are not to be applied in

this manner; this is done simply to facilitate a comparison of the various avoided cost proposals).

The results are tabulated as follows:

| | |
|---|---|
| GTE's Avoided Cost Study | 7.00% |
| Modified Avoided Cost Study: | |
| GTE Florida | 11.25% |
| AT&T's Proposed Avoided Cost | |
| Discount Rate | 30.9% |
| FCC's Estimated Avoided Costs | |
| for GTE | 18.81% |

## V. Resale

**Q. WHAT SERVICES WILL GTE OFFER AT WHOLESALE RATES FOR RETAIL?**

A. GTE will offer all the services it currently offers on a retail basis except for: below-cost services, promotional services, services that are already provided on a wholesale basis (e.g., special access sold to carriers and private line services offered predominately to carriers), grandfathered services, discounted calling plans, AIN services, non-recurring charge services, pay phone lines, semi-public pay phone lines, and COCOT coin and coinless lines.

**Q. WHY DOES GTE EXCLUDE THESE SERVICES?**

A. Let me first address GTE's position with respect to below-cost services. Under GTE's current rates, certain services are priced below cost. These services receive contributions from other services, such as intraLATA toll, access, and vertical and discretionary services, all of which are priced above incremental cost. If GTE were required to offer its below-cost services on a wholesale basis, then other carriers would (1) obtain avoided-cost discounts for both below-cost and above-cost services, and (2) be able to pocket the contributions from the above-cost services that had been used to price the other services below-cost. Accordingly, GTE could not cover its total costs unless these services are excluded from GTE's wholesale offerings or are repriced to cover their costs.

Second, GTE should not be required to offer services such as promotions on a wholesale basis, otherwise GTE would not be able to differentiate its retail services from those of competing carriers. Put another way, a competitor will be able to offer any service it wants on any terms and conditions it desires to attract new customers, and GTE needs this same flexibility to respond to competition on a retail basis and give its customers more choices.

For example, if GTE offers a special promotion to its customers but is required to provide that same promotion to AT&T on an avoided cost basis, then GTE could never differentiate its

offerings from those of AT&T. Importantly, GTE would have absolutely no incentive to develop additional promotions and other new services that would benefit customers because AT&T could take and use them for its own marketing and economic advantage. In fact, GTE could never differentiate its offerings from AT&T's. This result is contrary to the purpose of the Act by limiting choices to customers. The Act should be implemented in a manner that allows all carriers to respond to competition, including GTE.

Finally, GTE should not be required to offer at wholesale rates those services that have no avoided retail costs

**Q. HOW DOES GTE PROPOSE TO OFFER OPERATOR SERVICES AND DIRECTORY ASSISTANCE IN A RESALE ENVIRONMENT?**

A. GTE proposes to offer tariffed operator services and directory assistance services for resale on the same terms and at the same rates as the corresponding retail offerings. As discussed previously, there are no avoided costs associated with the wholesale provision of operator services or directory assistance; the services are offered and provided in the same manner and require the same activities, whether on a wholesale or retail basis. Except for any DA call allowance bundled with basic exchange service, there are separate tariff rates for these services, and the associated expenses are not included in the rates for other retail

services offered for resale. The services will be made available for resale, but there is no basis for wholesale rate that differs from the resale rate, as there are no avoided costs.

**Q. WHAT IS GTE'S POSITION WITH RESPECT TO SUBSCRIBER LINE CHARGES ASSOCIATED WITH RESALE SERVICES?**

A. GTE intends to bill all associated subscriber line charges to the ALEC reseller. GTE assumes the ALEC will, in turn, bill its end user customer a like amount.

## VI. Summary

**Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?**

A. Yes. Both of the avoided cost studies prepared by GTE produce results that are lower than the FCC's default avoided cost discount range of 17% to 25%, and significantly below AT&T's proposal of 30.9%.

Wholesale prices for resale services should be determined based on retail rates less avoided costs, as calculated using GTE's Avoided Cost Studies. The AT&T proposal and the FCC's avoided cost discounts both are artificially high and economically burdensome.

Also considered in developing the resale rates for basic exchange services is the fact that resellers do not generally endeavor to sell only the basic local service, but rather the entire bundle of services currently offered by GTE. GTE loses considerable contribution associated with any complimentary services, notably intraLATA toll, and this lost contribution is properly included as an opportunity cost in developing the proposed resale rates.

Finally, I have reviewed GTE's position with respect to various resale issues.

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

A. Yes.

Table 1.
Resale Opportunity Cost Summary

Tariff Entity: GTE Florida

| Class of Service | Toll Contribution | Access Contribution | Resale Opportunity Cost |
|---|---|---|---|
| Residence | $1.83 | $1.34 | $.49 |
| Business | $2.87 | $2.11 | $.76 |

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF DAVID S. SIBLEY**

**DOCKET NO. 960847-TP**

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

A. My name is David S. Sibley, University of Texas at Austin, 22nd and Speedway, Austin, TX, 78712.

**Q. PLEASE STATE YOUR PROFESSIONAL QUALIFICATIONS AND EDUCATIONAL BACKGROUND.**

A. I am the John Michael Stuart Professor of Economics at the University of Texas at Austin. Prior to joining the University of Texas at Austin, I was Head of the Economics Research Group at Bell Communications Research. I also served as a member of technical staff at Bell Laboratories. I have taught graduate level courses in regulation at the University of Pennsylvania and Princeton University, in addition to my work at the University of Texas.

During the Carter Administration, I served as Senior Staff Economist on the Council of Economic Advisors and as advisor to the Chairman of the Civil Aeronautics Board. During the last twenty years, I have carried out extensive research in the areas of regulation, industrial organization, and microeconomic theory. I have published articles on regulation and pricing in a number of

academic journals, including the *Journal of Economic Theory*, *Econometrica*, *American Economic Review*, *Rand Journal of Economics*, *Journal of Public Economics*, and the *Journal of Regulatory Economics*. I am a coauthor with Steven J. Brown of the textbook *The Theory of Public Utility Pricing* published by Cambridge University Press in 1986 and now in its fourth printing, and co-editor of *Telecommunications Demand Analysis: An Integrated View*, published by North-Holland in 1989. Currently, I serve as Associate Editor of the *Journal of Regulatory Economics*.

I received a B.A. in Economics from Stanford University and a Ph.D. in Economics from Yale University.

**Q. HAVE YOUR PREPARED A VITAE THAT DESCRIBES YOUR EDUCATION, PUBLICATIONS, AND EMPLOYMENT HISTORY?**

A. Yes. A copy of my most recent vitae is attached as Exhbit No. DSS-1.

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

A. The purpose of my testimony is to provide an economic analysis of the issues to be arbitrated in this proceeding between AT&T and GTE. In this regard, I adopt the report entitled, "An Economic Framework for Implementing the Pricing Provisions of the Telecommunications Act of 1996" (attached hereto as Exhibit

No. DSS-2). The report was prepared by Michael J. Doane, J. Gregory Sidak, Daniel F. Spulber, Michael A. Williams, and myself. The report identifies a pricing rule that would satisfy the requirements of the Telecommunications Act of 1996 while ensuring that local exchange carriers received just compensation. The economic analysis set forth in this report is specific to Florida.

**Q. IN CONNECTION WITH THE PREPARATION OF YOUR REPORT, WHAT MATERIALS HAVE YOU REVIEWED?**

A. I reviewed the Telecommunications Act of 1996 and the August 1996 order of the Federal Communications Commission (FCC) in its local competition docket, *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers, First Report and Order*, CC Dkt. Nos. 96-98, 95-185 (released Aug. 8, 1996) [hereinafter *First Report and Order*]. Additionally, I have reviewed the testimony and report prepared by David L. Kaserman entitled "Local Competition Issues and the Telecommunications Act of 1996."

**Q. WHAT IS YOUR IMPRESSION OF THE INTENT OF THE TELECOMMUNICATIONS ACT OF 1996?**

A. The Act offers the promise of an end to more than a half a century of monopoly regulation of the local exchange and telephone industry. The Act holds out the further promise of a new "pro-competitive, deregulatory" system for fostering competition in all segments of the telecommunications industry.

**Q. WHAT ARE THE CENTRAL PRINCIPLES OF THE TELECOMMUNICATIONS ACT?**

A. To open all telecommunications markets to competition so as to provide a procompetitive, deregulatory neutral policy framework designed to accelerate the delivery of advanced communications and information technologies to all Americans.

**Q. HOW ARE THESE PRINCIPLES BEING IMPLEMENTED?**

A. The Act requires incumbent local exchange carriers to offer their resale services to other carriers at wholesale costs. The Act also contains sweeping interconnection and unbundling provisions. Although Congress has provided guidance on the types of services subject to wholesale and unbundling requirements, "just and reasonable" rates must be negotiated or determined state-by-state, in proceedings like this one.

**Q. WHAT DO YOU SEE AS THE CONSEQUENCES OF THESE STATE-BY-STATE ARBITRATIONS?**

A. These arbitrations can affect the financial viability of GTE and every state's incumbent local exchange carriers. That issue, in turn, will have profound ramifications for the consumers of the state. For example, if prices are not appropriately set for mandatory network access, that will impair GTE's financial integrity. This will starve the local telecommunications network of future investment. That investment, however, is critical not only to replacing the existing infrastructure as it wears out, but also to maintaining and expanding that infrastructure so that it can serve as the backbone on which new competitors would enter the new competitive marketplace. Finally, many of the benefits that should accrue to all citizens from robust, fair competition will be eroded if GTE and other local exchange carriers are so weakened that they are unable to compete effectively with those companies entering the marketplace.

**Q. WHAT DOES ECONOMIC ANALYSIS IMPLY ABOUT THE PROPER OUTCOME OF THIS ARBITRATION PROCESS?**

A. Economic analysis indicates that, if GTE is to be required to sell or make available its services and products to AT&T and others, GTE should be reimbursed for all its costs and be allowed the opportunity to earn a reasonable rate of return as expressly authorized by Congress. Anything less would be a taking of GTE's property. Importantly, it would also deny the consumers

of this state the substantial benefits that ought to flow from robust, fair competition.

**Q. WHAT DOES THE ACT REQUIRE WITH RESPECT TO THE PRICE TO BE CHARGED BY INCUMBENT LOCAL EXCHANGE COMPANIES FOR UNBUNDLED NETWORK ELEMENTS?**

A. In section 252(d)(1), the Act requires three things. First, it requires that the price be "based on the cost (determined without reference to a rate of return or other rate-based proceeding) of providing the interconnection or network element." Second, it requires that the prices be "non-discriminatory." Third, the Act requires that such prices "may include a reasonable profit."

**Q. HAS AT&T PROPOSED A PRICING RULE FOR THE STATES TO USE FOR SETTING PRICES FOR UNBUNDLED NETWORK ELEMENTS?**

A. Yes. According to the report written by Kaserman, et al. on behalf of AT&T, AT&T is arguing that prices should be set equal to Total Service Long-Run Incremental Costs (TSLRIC) per unit.

**Q. WHAT IS TSLRIC?**

A. TSLRIC is a measure of the total incremental cost incurred in the long run that is caused by the addition (or deletion) of a service from an existing set of services.

**Q. DOES TSLRIC PRICING SATISFY THE ACT'S REQUIREMENTS?**

A. Absolutely not.

**Q. HOW WOULD YOU CHARACTERIZE AT&T'S PROPOSAL OVERALL?**

A. It is very curious. In a new era of deregulation, AT&T has set forth a proposal that will actually increase regulation in the industry. At the same time, the AT&T proposal is structured to require monumental subsidies from GTE to AT&T. As a robust competitor in the marketplace, AT&T is already demonstrating through this proposal its ability to compete aggressively with local exchange carriers. Its very proposal is structured deliberately to give AT&T a most-favored position in the new marketplace while simultaneously saddling its new competitors with a mountain of costs. AT&T knows that it will enjoy a tremendous competitive advantage if it can enter this new arena without having to pay the costs imposed on everyone else. While I understand AT&T's motive for pushing its proposal, it is incomprehensible to me how this proposal can be squared with either the objectives or the literal terms of the Telecommunications Act of 1996.

**Q. WHY DO YOU THINK TSLRIC IS NOT A REASONABLE PRICING RULE FOR STATE COMMISSIONS TO USE?**

A. There are at least ten specific problems with using TSLRIC pricing of unbundled network services:

(1) TSLRIC pricing does not reflect the firm's total direct costs;

(2) TSLRIC pricing does not reflect the firm's economic costs;

(3) TSLRIC pricing is not competitive pricing;

(4) TSLRIC pricing promotes free riding by competitors;

(5) TSLRIC pricing subsidizes entrants;

(6) TSLRIC pricing does not take into account the shifts in costs from attributable costs to joint and common costs due to unbundling, thus creating incentives for excessive and economically inefficient unbundling;

(7) TSLRIC pricing fails to include joint and common cost increases that are due to unbundling;

(8) TSLRIC pricing creates incentives for the incumbent to reduce its joint and common or shared costs;

(9) TSLRIC pricing lacks dynamic pricing flexibility and creates incumbent burdens; and

(10) TSLRIC pricing is discriminatory.

**Q. HAVE YOU PROPOSED A PRICING RULE THAT DOES MEET THE REQUIREMENTS OF THE ACT?**

A. Yes, I have.

**Q. WHAT WERE THE UNDERLYING REQUIREMENTS THAT YOU THOUGHT YOU HAD TO SATISFY IN CREATING THIS APPROACH?**

A. I wanted an approach that would satisfy all the requirements that Congress established for setting prices for resale and unbundled networks. Specifically, the approach had to generate prices that would be based on cost, would be non-discriminatory, and would allow the Incumbent Local Exchange Carrier (ILEC) the opportunity to earn a reasonable profit. Furthermore, without endorsing all aspects of the pricing proposals contained in the FCC's *First Report And Order*, I wanted the pricing rule to satisfy the FCC's condition "that, under [a total element long-run incremental cost] methodology, incumbent LECs' prices for . . . unbundled network elements shall recover the forward-looking costs directly attributable to the specified element as well as a reasonable allocation of forward-looking common costs." That condition can be found at paragraph 62 of the *First Report And Order*.

**Q. WHAT DO YOU CALL YOUR PRICING RULE?**

A. The Market-Determined Efficient Component-Pricing Rule, or the M-ECPR.

**Q. HOW DOES THE M-ECPR RELATE TO THE ECPR DESCRIBED AND REJECTED BY THE FCC IN ITS *FIRST REPORT AND ORDER*?**

A. There are some very important differences. First, to avoid confusion, I will call the rule discussed by the FCC the "FCC-ECPR." The FCC-ECPR was properly rejected by the FCC. It was a very simplistic rule. It failed to take into account that there would be competitive entry in setting prices for unbundled network elements. This is a very significant omission when you consider that the entire purpose of the Telecommunications Act of 1996 is to foster competitive entry. That is why I have labeled my pricing rule the Market-Determined Efficient Component-Pricing Rule, or the M-ECPR. In other words, the M-ECPR takes full account of the competitive entry when setting prices for unbundled networks elements. In that respect, the M-ECPR benefits consumers and avoids all of the shortcomings that the FCC quite properly attributed to the FCC-ECPR.

**Q. WHAT IS THE M-ECPR?**

A. The M-ECPR is a market-based method for determining, as the FCC directed, the reasonable share of forward-looking common costs that should be allocated to the prices for the incumbent LEC's various unbundled network elements. The M-ECPR price for an unbundled network element is equal to the sum of its TELRIC plus its opportunity cost, as constrained by market

forces. Opportunity costs refers to the net return that an unbundled network element will bring GTE if it is not sold at wholesale to a competitor. Like the market, the M-ECPR does not permit GTE to charge a price for an unbundled element that exceeds that element's stand-alone cost. That market-determined outcome coincides precisely with the regulatory prescription in section 51.505(a)(1) of the rules announced in the FCC's *First Report and Order* -- namely, that "[t]he sum of a reasonable allocation of forward-looking common costs and the total element long-run incremental cost of an element shall not exceed stand-alone costs associated with the element."

**Q. DOES THE M-ECPR ALSO CALCULATE THE PRICE FOR GTE'S WHOLESALE SERVICES RESOLD TO COMPETITORS?**

A. Yes. Again, the M-ECPR is consistent with the resale provisions contained in the Telecommunications Act and the *First Report And Order*. In contrast, AT&T has proposed the "Avoided Cost Pricing Rule," which is an overt attempt to secure a substantial entry subsidy to be paid by GTE.

**Q. IS THE M-ECPR A COMPLETE SOLUTION TO ALL PRICING PROBLEMS?**

A. No. The M-ECPR does not alter the traditional problems faced by a regulated local exchange carrier operating with a retail rate structure that contains cross subsidies mandated by regulation.

**Q. WHAT IS THE PRACTICAL EFFECT OF THAT LIMITATION?**

A. The M-ECPR does not afford GTE the opportunity to recover fully its forward-looking common costs, as would regulated rates absent competitive entry. Facilities-based entry and M-ECPR pricing of unbundled network elements will, therefore, permit stranded costs to arise. I define stranded costs to be the present value of the firm's net revenues under regulation minus the present value of the firm's net revenues under competition. To ensure that GTE receives a reasonable opportunity to recover all of its forward-looking common costs, it is necessary for this arbitration to establish a competitively neutral, non-bypassable end-user charge.

**Q. WHAT KINDS OF FORWARD-LOOKING COSTS WOULD THE END-USER CHARGE RECOVER?**

A. There are six categories of costs that GTE cannot fully recover through competitive M-ECPR prices but nonetheless will incur on a forward-looking basis to discharge its obligation to serve.

**Q. WHAT ARE THEY?**

A. They are:

(1) shared costs of network operation, incurred among two or more (but not all) of GTE's services, but not wholly attributable to any single service;

(2) common costs of network operation, incurred among all of GTE's services;

(3) losses incurred in GTE's provision of services to preferred classes of customers at regulated prices that are below GTE's incremental cost of providing such services;

(4) costs incurred as a result of incumbent burdens that GTE continues to bear after the advent of competition, but which GTE's competitors are not required to bear, such as carrier-of-last-resort obligations;

(5) costs incurred by GTE to accomplish government-mandated unbundling of network elements or resale of network services; and

(6) losses incurred when GTE's avoided costs are incorrectly overstated and are used to establish the discount that competitors receive when purchasing wholesale services from GTE.

**Q. WOULD THE END-USER CHARGE ALLOW GTE TO RECOVER MONOPOLY PROFITS OR COSTS INEFFICIENCIES?**

A. No. Its sole purpose is to allow GTE a reasonable opportunity to recover the costs that I have just described. It is interesting to note, also, that AT&T has not offered evidence that GTE has any monopoly profits or cost inefficiencies. Without an end-user charge, GTE would be assured of incurring *losses* on its sale of unbundled network elements.

**Q. DO YOU EXPECT THAT THE END-USER CHARGE WILL NECESSARILY BE A PERMANENT RECOVERY MECHANISM?**

A. No. The need for an end-user charge will diminish over time as the incumbent LEC recovers the cost of its past investment. Other Commission actions, such as rate rebalancing, can reduce the need for such a charge.

**Q. WHAT IS YOUR ASSESSMENT OF THE *FIRST REPORT AND ORDER* RELEASED BY THE FCC ON AUGUST 8, 1996?**

A. The language of the *First Report and Order* could be read to preclude GTE from recovering all of its forward-looking costs. It also makes no effort to allow GTE to recover its historic costs. Prohibiting GTE from recovering these costs would violate the plain terms of the 1996 Act that requires incumbent local exchange carriers to be compensated for their costs. Even more, it would lead to a taking of GTE's property.

**Q. DOES YOUR REPORT PRESENT PRICES COMPUTED ACCORDING TO ONE OF THE RECOMMENDED METHODS OF ALLOCATING FORWARD-LOOKING COMMON COSTS THAT IS CONTAINED IN THE FCC'S *FIRST REPORT AND ORDER*?**

A. Yes. Although I do not endorse any version of fully distributed cost (FDC) pricing, the report calculates prices for GTE's unbundled network elements using a procedure that is equivalent to the FCC's recommended method of allocating forward-looking

common costs according to a fixed percentage markup over total element long run incremental cost.

**Q. CAN YOU GENERALIZE CONCEPTUALLY THE DIFFERENCES BETWEEN AT&T'S PRICING RULE AND THE M-ECPR THAT YOU ENDORSE?**

A. Yes. First, AT&T's proposal would protect competitors and promote new forms of regulation that would attempt to "manage" competition. GTE's proposal will promote competition and efficient entry, and it will allow regulation to recede as competition develops.

Second, although both parties agree that the pricing of unbundled network elements should be based on economic costs, there is disagreement on what is the proper definition of economic costs. AT&T argues that economic costs should be limited to GTE's Total Service Long Run Incremental Costs (TSLRIC). GTE maintains that economic costs should also include opportunity costs, as constrained by the market. The attached report demonstrates that economic costs include market-determined opportunity costs.

Third, although both parties agree that the pricing of resale services should equal the retail rate minus avoided retail costs in

accordance with the 1996 Act, AT&T further proposes (1) to subtract unsubstantiated "product inefficiencies" and "excess profit" and (2) to exclude GTE's wholesaling costs. Moreover, AT&T asserts that per-unit avoided costs should be calculated assuming GTE ceases to provide retail services. GTE maintains that net avoided retail costs (that is, avoided retail costs net of any additional wholesale costs) should be the discount; moreover, the size of the discount should be determined on the basis of a reasonable projection of the amount of retail services that GTE will no longer provide as a result of reseller entry. The accompanying report will show that a discount equal to the net avoided retail costs is the economically correct discount.

**Q. HOW WOULD YOU SUMMARIZE THE CHOICE THAT THE COMMISSION MUST MAKE BETWEEN AT&T'S PRICING RULE AND YOUR PRICING RULE?**

A. AT&T's pricing formulas would deny GTE recovery of its total costs, require GTE's shareholders to subsidize AT&T's entry into local exchange telephony, and confiscate the private property of GTE's shareholders. GTE's pricing formulas would meet the deregulatory objectives set forth in the Telecommunications Act of 1996, satisfy the FCC's recommendation that prices for wholesale services and unbundled network elements be priced on the basis of forward-looking costs, and allow competition and economically efficient entry into the marketplace.

**Q. DO YOU HAVE ANY ATTACHMENTS TO YOUR TESTIMONY?**

A. Yes. I attach as Exhibit No. DSS-2, and incorporate into my testimony, "An Economic Framework for Implementing the Pricing Provisions of the Telecommunications Act of 1996," which I have prepared with Michael J. Doane, J. Gregory Sidak, Daniel F. Spulber, and Michael A. Williams.

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

A. Yes.

# DAVID S. SIBLEY

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## EDUCATION:

1969 B. A. in Economics, Stanford University
1973 Ph.D. in Economics, Yale University

## TEACHING FIELDS:

Industrial Organization, Economics of Information

## RESEARCH FIELDS:

Economics of asymmetric information, telecommunications policy, public utility pricing, models of firm's internal organization.

## PROFESSIONAL EXPERIENCE:

March, 1992 - Present: John Michael Stuart Centennial Professor of Economics, University of Texas at Austin.

August, 1991-March, 1992: Edward Everett Hale Centennial Professor of Economics, University of Texas at Austin.

September, 1983 - August, 1991: Research Manager, Bell Communications Research, Morristown, NJ. Head of Economics Research Group.

September 1981 - September 1983: Member of Technical Staff, Bell Laboratories, Murray Hill, NJ.

September 1980 - September 1981: Adviser to the Chairman of the Civil Aeronautics Board.

January 1980 - September 1980: Consultant, Civil Aeronautics Board, Washington, D.C.

September 1978 - January 1980: Senior Staff Economist, Council of Economic Advisers, Executive Office of the President, Washington, D.C.
October 1973 - September 1978: Member of Technical Staff, Bell Laboratories, Holmdel, NJ.

## TEACHING:

Since September 1991: Introductory Microeconomics, undergraduate and graduate Industrial Organization.

Fall 1989: Visiting Lecturer, Woodrow Wilson School of Public and International Affairs, Princeton University. Graduate course in regulation and public choice.

September 1983 - December 1983: Adjunct Lecturer in Economics, University of Pennsylvania. Taught graduate course on regulation.

## PUBLICATIONS:

**A. Journal Articles:**

"A Note on the Concavity of the Mean-Variance Problem, "*Review of Economic Studies*, July 1975.

"Permanent and Transitory Income Effects in a Model of Optimal Consumption with Wage Income Uncertainty," *Journal of Economic Theory*, August 1975.

"Optimal Foreign Borrowing with Export Revenue Uncertainty," (with J. L. McCabe), *International Economic Review*, October 1976.

" Regulatory Commission Behavior: Myopic vs. Forward-Looking," (with E. E. Bailey), *Economic Inquiry*, June 1978.

"Optimal decisions with Estimation risk,," (with L.C. Rafsky, R. W. Klein and R. D. Willig), *Econometrica*, November 1977.

"The Demand for Labor in a Dynamic Model of the Firm, "*Journal of Economic Theory*, October 1977.

"Public Utility Pricing Under Risk: The Case of Self-Rationing," (with J. C. Panzar), *American Economic Review*, December 1978.

"A Dynamic Model of the Firm with Stochastic Regulatory Review," (with V. S. Bawa), *International Economic Review*, October 1980.

"Optimal Nonlinear Pricing for Multiproduct Monopolies," (with L. J. Mirman), *Bell Journal of Economics*, Autumn 1980.

"Efficiency and Competition in the Airline Industry," (with D. R. Graham and D. P. Kaplan), *Bell Journal of Economics*, Spring 1983.

"Optimal Non-Uniform Pricing," (with M. B. Goldman and H. E. Leland), *Review of Economic Studies*, April 1984.

" Reply to Lipman and Further Results," *International Economic Review*, June 1985.

"Public Utility Pricing Under Risk: A Generalization," *Economics Letters*, June 1985.

"Optimal Consumption, the interest Rate and Wage Uncertainty," (with D. Levhari), *Economics Letters*, 21 (1986).

"Regulating Without Cost Information: The Incremental Surplus Subsidy Scheme," with D. M. Sappington), *International Economic Review*, May 1989.

"Optimal Two Part Tariffs for Inputs," (with J. C. Panzar), *Journal of Public Economics*, 40 (1989) 237-249.

"Asymmetric Information, Incentives and Price Cap Regulation," *Rand Journal of Economics*, Fall 1989.

"Compensation and Transfer Pricing in a Principal-Agent Model," (with d.ZE. Besanko), *International Economic Review*, February, 1991.

"Regulating Without Cost Information: Some Further Thoughts," (with D. M. Sappington), *International Economic Review*, November, 1990.

"Thoughts on Nonlinear Pricing Under Price Cap Regulation," (with D. M. Sappington), *Rand Journal of Economics*, Spring, 1992.

"Ex Ante vs. Post Pricing: Optional Calling Plans vs. Tapered Tariffs,'(with K. Clay and Psrinagesh), *Journal of Regulatory Economics*, 4 (1992) 115-138.

"Optimal Non-linear Pricing With Regulatory Preference over Customer Types," (with W. W. Sharkery), *Journal of Public Economics*.

"A Bertrand Model of Pricing and Entry," (with W. W. Sharkey) *Economics Letters*, 41 (1993) 199-206.

"Regulatory Incentive policies and Abuse," (with D. M. Sappington), forthcoming in *Journal of Regulatory Economics*, 2: 131-142, 1993.

"Multiproduct Nonlinear Prices with Multiple Taste Characteristics," (with P. Srinagesh), forthcoming in *Rand Journal of Economics*.

**B. Reports and Articles in Conference Volumes**

"The Dynamics of Price Adjustment in Regulated Industries," (with E. E. Bailey) , in *Proceedings of IEEE Conference on Systems* Control, 1974.

"Optimal Non-Uniform Pricing for electricity: Some Illustrative Examples," (with R. W. Koenker), in Sichel (ed.) *Public Utility Ratemaking in an energy-Conscious Environment*, Praeger, 1979.

"Antitrust Policy in the Airline Industry," (with S. B. Jollie), civil Aeronautics Board, October 1982. Transmitted by the CAB to Congress as part of proposed sunset legislation.

"Deregulation and the Economic Theory of Regulation," (with W. W. Sharkey), *Proceedings of the Eleventh Annual Telecommunications Policy Research Conference*, 1983.

"An Analysis of Tapered Access Charges for End Users," (with W. E. Taylor, D. P. Heyman and J. M. Lazorchak) , published in *the Proceedings of the Eighteenth Annual Williamsburg Conference on Regulation*, H. Treeing (ed.), Michigan state, 1987.

*Report to the Governor*, The Task Force on Market-Based Pricing of Electricity. Co-authored with D. M. Sappington, Appendix III.

"Optional Tariffs for Access in the FCC's Price Cap Proposal," (with D. P. Heyman and W. E. Taylor), forthcoming in M. Einhorn (ed.), *Price Caps and Incentive Regulation in the Telecommunications Industry*, Kluwer, 1990.

**C. Books:**

*The Theory of Public Utility Pricing*, (with S. J. Brown), Cambridge University Press, 1986. Second printing 1986. Third printing 1989. Revised edition planned.

Co-editor of *Telecommunications Demand Analysis*: *An Integrated View*, North-Holland, 1989.

## COMPLETED PAPERS:

"A Repeated Game Model of Price Cap Regulation", (with S. J. Wilkie), submitted to *Journal of Economics and Management Strategy*.

"Incumbency and Bidding Behavior in the Dallas-Ft. Worth Milk Market," (with C. Hewitt and J. T. McClave), submitted to *American Economic Review*.

"Competitive Incentives of Vertically-Integrated Local Exchanges Carriers," (with D. Weisman), submitted to *Journal of Industrial Economics*.

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Exhibit No. DSS-2
FPSC Exhibit No. _____
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# An Economic Framework for Implementing the Pricing Provisions of the Telecommunications Act of 1996

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# Executive Summary

The Telecommunications Act of 1996 (Act) promised to end more than a half century of monopoly regulation of the local telephone exchange. The Act held out the promise of what Congress characterized as a "pro-competitive, deregulatory" system for fostering competition in all segments of the telecommunications industry. Unfortunately, the proposals submitted by AT&T seek to skew the new world of competition by establishing special privileges for that firm relative to GTE and other local exchange carriers.

AT&T seeks to do this by proposing a new era of *increased* regulation coupled with subsidies to AT&T. The reason is simple enough. AT&T knows that it will enjoy a tremendous competitive advantage if it can enter this new arena without having to pay the costs imposed on everyone else. In contrast, our pricing proposal would provide AT&T, GTE, and other potential entrants an equal opportunity to compete. AT&T should not be allowed to twist the rules to produce entry subsidies that will preordain the outcome of the competitive process.

Our economic analysis indicates that, if GTE is to be required by the government to sell or make available its services and products to AT&T and others, GTE should be reimbursed for all its costs and be allowed the reasonable rate of return expressly authorized by Congress. Anything less would be a taking of GTE's property. As importantly, it would deny the consumers of this state the substantial benefits of robust, fair competition.

The pricing of government-mandated access to wholesale services and unbundled network elements raises important questions of regulatory economics. But the complexity of those questions should not obscure one simple fact: An incumbent local exchange carrier (ILEC) will become insolvent if it cannot recover its total costs.

GTE's ability to recover its costs has profound ramifications for the consumers of this state. Prices for services and network elements that impair GTE's financial integrity will discourage investment in the local telecommunications network. That investment, however, is critical not only to replacing the existing infrastructure as

it wears out, but also to maintaining and expanding the infrastructure necessary for new competitors to enter the market for local telephony.

However, the pricing formula that AT&T has proposed for the resale of an ILEC's services and unbundled network elements would deny GTE recovery of and a reasonable return on its costs, require GTE's shareholders to subsidize AT&T's entry into local exchange telephony, and cause a taking of property. The same problems arise with some of the pricing rules and default proxy rates established by the Federal Communications Commission (FCC) in its *First Report and Order*.[1]

To limit the taking of property and allow GTE to recover its true costs, this arbitration must properly apply the economic framework explained in this report. Under this economic framework, the "market-determined efficient component-pricing rule" (M-ECPR) is used to calculate GTE's forward-looking costs as determined by the market. However, because of the state-mandated cross subsidies embedded in GTE's rate structure, the M-ECPR used alone will not allow GTE to fully recover its costs. Therefore, if this Commission is to avoid leaving GTE uncompensated for a portion of its costs, this Commission must also establish a competitively neutral, nonbypassable end-user charge.

## THE ECONOMIC FRAMEWORK PRESENTED IN THIS REPORT PROMOTES EFFICIENT COMPETITION AND ALLOWS GTE TO RECOVER ITS ECONOMIC COSTS

As explained above, the critical issue presented by this arbitration is whether the incumbent LEC should be permitted to recover all of its costs. Those costs fall into two categories: (1) forward-looking costs, and (2) historical costs. Denying GTE a reasonable opportunity to recover fully both its forward-looking and historical costs would cause a taking.

With respect to the recovery of forward-looking costs, the appropriate pricing rule is the M-ECPR. Unlike the efficient compo-

1. Contrary to the Telecommunications Act of 1996, the FCC established detailed rules for the states to employ when pricing the incumbent LEC's wholesale services and unbundled networks. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996 and Interconnection between Local Exchange Carriers and Commercial Mobile Radio Service Providers, First Report and Order, CC Dkt. Nos. 96-98, 95-185 (released Aug. 8, 1996) [hereinafter *First Report and Order*].

nent-pricing rule described in the *First Report and Order* (the FCC-ECPR), which the FCC rejected, the M-ECPR caps prices at the market price level. Thus, where competition exists, the M-ECPR limits GTE's ability to recover its costs to competitive price levels. In addition, the M-ECPR has the added benefit of satisfying the *First Report and Order*'s provisions regarding the recovery of forward-looking joint and common costs.

Absent competitive entry, regulated rates are set to allow the incumbent LEC a reasonable opportunity to recover all forward-looking costs. Because the M-ECPR price is capped at competitive market levels, however, it will not allow GTE to recover all of its forward-looking costs. In addition, competition may not allow GTE to recover fully the cost of past investment. The difference between the recovery permitted under regulated rates and that permitted by the applicable pricing rule (M-ECPR) represents GTE's "stranded costs." Thus, the magnitude of these stranded costs will increase as competition increases. To enable GTE to recover its stranded costs, a competitively neutral end-user charge (that cannot be bypassed) should be permitted. Moreover, such a charge is required unless and until the state ends state-mandated cross subsidies embedded in GTE's rate structure.

As explained above, stranded costs represent the difference between the recovery permitted under regulated rates and that permitted by the applicable pricing rule. Because the *First Report and Order* recommends limiting cost recovery to forward-looking costs, it envisions no recovery of past investment costs. Absent a mechanism for recovering stranded costs, GTE's shareholders will be denied any opportunity to recover a significant portion of the overall investment that they have made. That investment was made with the expectation that regulators would give GTE the reasonable opportunity to recover, and earn a competitive return on, the capital supplied by its investors.

In short, to promote efficient competition under the Act and to avoid a taking of the property of GTE's shareholders, this arbitration must give GTE the reasonable opportunity to recover both its forward-looking and historical costs. This can be accomplished by using the M-ECPR to calculate GTE's forward-looking costs as determined by the market and assessing a competitively neutral end-user charge to allow GTE to recover the costs that GTE cannot recover because of the current rate structure.

## THIS ARBITRATION MUST ESTABLISH RATES BASED UPON THE M-ECPR TO ALLOW GTE TO RECOVER FORWARD-LOOKING COMMON COSTS

The M-ECPR satisfies the FCC's recommendation that prices be based on forward-looking costs, and when combined with a competitively neutral end-user charge, satisfies the requirement in section 252(d)(1) of the Communications Act that the incumbent LEC be allowed to earn "a reasonable profit."[2] The *First Report and Order* in turn provides "that, under a [total element long run incremental cost] methodology, incumbent LECs' prices for . . . unbundled network elements shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[3]

As discussed above, the M-ECPR differs from the FCC's description of the efficient component-pricing rule in the *First Report and Order*, which, to avoid confusion, we shall call the FCC-ECPR. We agree that the agency correctly rejected the FCC-ECPR. Unlike the simplistic FCC-ECPR, however, the M-ECPR takes full account of competitive entry by capping the price for each unbundled network element at the price of its market alternative. In that respect, the M-ECPR benefits consumers and avoids all of the shortcomings that the FCC attributed to the FCC-ECPR.

The M-ECPR is a market-based method for determining, as the FCC directed, the reasonable share of forward-looking common costs that should be allocated to the prices for unbundled network elements. To apply the M-ECPR to this arbitration, GTE staff assembled estimates of the TELRIC for each of GTE's unbundled network elements. Next, GTE's forward-looking common costs were estimated and found to be substantial not only in absolute magnitude, but also as a percentage of GTE's total costs. Finally, following the FCC's methodology in its *First Report and Order*, we calculated the allowed price for each of GTE's unbundled network elements as equal to the sum of (1) the element's TELRIC and (2) the reasonable allocation to that element of GTE's forward-looking common costs. Because the market will not permit GTE to charge a price for an unbundled element that exceeds that element's stand-alone cost, the M-ECPR coincides precisely with the FCC's recommendation that "[t]he sum of a reasonable allocation of forward-looking common costs and the total

2. 47 U.S.C. § 252(d)(1).

3. *First Report and Order* at ¶ 682.

element long-run incremental cost of an element shall not exceed stand-alone cost associated with the element."[4] In short, the M-ECPR produces exactly that result and thus complies with both federal regulatory pronouncements and the constraints of a competitive market.

The M-ECPR also provides the proper economic framework for calculating the price of GTE's wholesale services. Again, the M-ECPR is consistent with the resale provisions contained in the Act and the *First Report and Order*. In contrast, AT&T's "Avoided Cost Pricing Rule" is an overt attempt to secure an entry subsidy to be paid from GTE's shareholders. AT&T's economists, for example, argue that GTE should not be paid for the incremental cost that it must incur to supply wholesale services to its competitors. AT&T's economists, Professors Kaserman, et al., further assert that the wholesale price that AT&T should pay should be reduced to reflect monopoly profits that GTE supposedly earns and cost inefficiencies that it supposedly tolerates. AT&T's argument presumes that state regulation of GTE has been an utter failure up to this point. It is no surprise that AT&T has failed to produce any evidence that GTE has either monopoly profits or cost inefficiencies.

## THIS ARBITRATION MUST ESTABLISH A COMPETITIVELY NEUTRAL, NONBYPASSABLE END-USER CHARGE TO ALLOW GTE TO RECOVER ITS STRANDED COSTS

If this Commission wants to preserve GTE's existing rate structure while giving GTE a reasonable opportunity to recover its total costs, then the Commission must establish an end-user charge. GTE cannot fully recover its forward-looking common costs by using the M-ECPR because the M-ECPR caps the price for each unbundled network element at the price of its market alternative. Because GTE operates under a rate structure that contains many cross subsidies mandated by regulation, its full costs cannot be recovered by pricing based solely on market alternatives. To compensate GTE for those additional costs, a competitively neutral, nonbypassable end-user charge is necessary.

Without an end-user charge, facilities-based entry and M-ECPR pricing of unbundled network elements would result in stranded costs, that is, the difference between the value of GTE's net revenues

4. 47 C.F.R. § 51.505(a)(1), in *id.*, Appendix B, at B-30.

under regulation and what GTE will earn under the M-ECPR.[5] Because the amount of the M-ECPR is capped by competitive prices, the magnitude of those stranded costs will grow as greater competition drives down the price that the M-ECPR permits GTE to charge.

Portions of six categories of costs cannot be recovered fully without end-user charges:

1. shared costs of network operation, incurred among two or more (but not all) of GTE's services, but not wholly attributable to any single service;

2. common costs of network operation, incurred among all of GTE's services;

3. losses incurred in GTE's provision of services to preferred classes of customers at regulated prices that are below GTE's incremental cost of providing such services;

4. costs incurred as a result of incumbent burdens that GTE continues to bear after the advent of competition, but which GTE's competitors are not required to bear, such as carrier-of-last-resort obligations;

5. costs incurred by GTE to accomplish government-mandated unbundling of network elements or resale of network services; and

6. losses incurred when GTE's avoided costs are incorrectly overstated and are used to establish the discount that competitors receive when purchasing wholesale services from GTE for resale.

The purpose of the end-user charge would be to afford GTE a reasonable opportunity to recover the foregoing costs, *not* to recover any purported monopoly profits or cost inefficiencies. Moreover, AT&T has not proven that GTE has any monopoly profits or cost inefficiencies. If this arbitration fails to establish an end-user charge, then GTE will be assured of incurring *losses* on its sale of unbundled network elements. In that case, this arbitration will have denied GTE

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5. Stranded costs are defined as the present value of the firm's net revenues under regulation minus the present value of the firm's net revenues under competition.

not only an opportunity to recover its costs, but also the ability to earn the "reasonable profit" that section 252(d)(3) permits.

## THE FCC'S CONFISCATORY EDICTS IN THE *FIRST REPORT AND ORDER* ARE INCONSISTENT WITH THE INTENT OF THE TELECOMMUNICATIONS ACT AND WOULD RESULT IN A TAKING

If certain provisions of the FCC's *First Report and Order* were adopted in this arbitration, GTE would not receive its full costs and a taking of its shareholders' property would result.

The FCC effectively directed the states to confiscate the private property of the incumbent LEC for the benefit of competitive entrants by denying the incumbent LEC the right (1) to recover forward-looking common costs on network elements (particularly loops) that would permit higher levels of cost recovery without exceeding an entrant's stand-alone cost for that particular element; and (2) to pursue recovery of forward-looking common costs by charging prices for unbundled network elements equal to their stand-alone costs. If this arbitration were to adhere to those FCC edicts, this Commission would deny GTE any reasonable opportunity to achieve full recovery of forward-looking costs and, thus, effect a taking of property.

## THE FCC'S COST-ALLOCATION METHODS WOULD SUBSIDIZE ENTRANTS AT THE EXPENSE OF THE ILEC

The FCC offered two cost-allocation methods by which an incumbent LEC would be allowed to seek recovery of forward-looking common costs. The first method was a fixed markup.[6] The practical effect of a fixed percentage markup, however, is to subsidize entrants at the expense of the incumbent LEC. The FCC's second method for allocating common costs among unbundled network elements "would allocate only a relatively small share of common costs to certain critical network elements, such as the local loop and collocation, that are most difficult for entrants to replicate promptly (i.e., bottleneck facilities)."[7] Similarly, this second method also subsidizes entrants: It is a sham for the FCC to recommend to incumbent LECs that they recover their forward-looking common costs only by raising the prices of the most price-sensitive network elements above TELRIC. Such

6. *First Report and Order* at ¶ 696.
7. *Id.*

pricing would deny the incumbent LEC any reasonable opportunity to recover *any* appreciable amount of its forward-looking common costs.

## THE FCC'S PROHIBITION ON PRICING ANY ELEMENT AT STAND-ALONE COST PREVENTS THE ILEC FROM RECOVERING THE TOTAL FORWARD-LOOKING COSTS OF ITS NETWORK

The FCC specified that "[i]n no instance should prices exceed the stand-alone cost for a specific element, *and in most cases they should be below stand-alone costs*."[8] The first half of that sentence is superfluous because competition already prevents a firm from charging a price exceeding stand-alone cost. The second half of the sentence, however, assures that the incumbent LEC would never be able to cover its total forward-looking costs. After telling the incumbent LEC not to use its pricing of unbundled loops to recover forward-looking common costs, the FCC would take away as well the LEC's ability to raise the price of its remaining unbundled elements to *their* stand-alone costs. Given the ability of the entrant to combine at will its own network elements with its purchase of unbundled LEC elements, the FCC's approach to pricing would ensure that the incumbent LEC would be prevented from earning the requisite contributions from its sale of unbundled elements to recover the total forward-looking costs of its network.

## AT&T'S PROPOSAL SHOULD BE REJECTED BECAUSE IT WOULD ALLOW AT&T TO BE SUBSIDIZED BY GTE, DENY GTE ITS TOTAL COSTS, AND ADD REGULATION TO THE INDUSTRY

AT&T's economists have attempted to advance a misconception that AT&T's proposed pricing models would benefit competition. To the contrary, AT&T's proposed pricing would prop up entrants at the expense of consumers and the current shareholders of the incumbent LECs. Society does not benefit when scarce resources are used to supply redundant services, or when regulators fail to give an incumbent firm the proper economic incentives to maintain, upgrade, and replace its capital stock over time. The FCC stated clearly in its *First Report and Order* that properly applied rules for the pricing of mandatory network access should promote competition, not compet-

8. *Id.* at ¶ 698 (emphasis added).

itors. A firm with the resources of AT&T needs no subsidy. Despite the rhetoric of AT&T's economists, the net result of their pricing proposals would be to direct GTE to award an entry subsidy to America's largest telecommunications company.

Additionally, AT&T's proposal would protect select competitors and promote new forms of regulation that would attempt to "manage" competition. In contrast, GTE's proposal is consistent with competition and efficient entry, and it allows regulation to recede as competition develops.

In sum, AT&T's pricing formulas would deny GTE recovery of its total costs, require GTE's shareholders to subsidize AT&T's entry to local exchange telephony, and cause a taking of property. In contrast, GTE's formulas meet the deregulatory objectives set forth in the Telecommunications Act and promote competition and economically efficient entry into the marketplace.

# I

# Introduction

This report presents an economic framework for implementing Sections 251 and 252 of the Telecommunications Act of 1996 (hereinafter referred to as the "*Act*"). In so doing, we respond to the report of Professor Kaserman, et al. on behalf of AT&T entitled *Local Competition Issues and the Telecommunications Act of 1996* (hereinafter referred to as the "Kaserman Report").[1] We begin by examining the *points of agreement* between the parties involved. By identifying common ground, it is then possible to move forward in a constructive manner to resolve those points of disagreement that remain outstanding.

What are the points of agreement? There is broad agreement between GTE and AT&T on many major points:

(1) The deregulatory objectives set forth in the *Act* are worthwhile and positive developments, and competitive rules and pricing should conform to the *Act*;

(2) Competition in local exchange markets and economically efficient entry are highly desirable;

(3) Pricing of resale and unbundled network services should be based on economic cost;

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1. David L. Kaserman, John W. Mayo, Michael A. Crew, Nicolas Economides, Glenn R. Hubbard, Paul R. Kleindorfer, and Carlos Martins-Filho, *Local Competition Issues and the Telecommunications Act of 1996* (July 15, 1996).

(4) Pricing of unbundled network services should equal Total Element Long Run Incremental Cost ("TELRIC") plus X (although the size of the markup, X, remains a matter of disagreement);

(5) Pricing of resale services should equal the retail rate minus avoided retail costs in accordance with the *Act*; and

(6) Competitive rules and unbundling requirements should be fair and nondiscriminatory.

Given such broad areas of agreement, what remain as matters of disagreement? Some of the remaining issues are matters of interpretation and emphasis, while others are questions of economic analysis. Ultimately, the issues affect the "bottom line" for both incumbents and entrants. As a guide to arbitration, it is useful to understand the key points of possible disagreement:

(1) While both parties favor competition and entry, GTE views the proposals of AT&T as creating further regulation, while AT&T views the proposals of GTE as perpetuating current regulation. This report will demonstrate that AT&T's proposal serves to protect competitors and promote new forms of regulation that will manage competition, while GTE's proposal is consistent with competition and efficient entry, and allows regulation to recede as competition develops.

(2) While both parties agree that pricing of unbundled network elements should be based on economic costs, there is disagreement on the definition of economic costs. AT&T argues that economic costs equal a lower number, i.e., GTE's Total Element Long Run Incremental Costs (TELRIC).[2] GTE maintains that economic costs should equal a higher number, i.e., TELRIC plus opportunity costs as constrained by the market. This report will demonstrate that economic costs include market-determined opportunity costs.

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2. In this report, we adopt the terminology contained in the FCC's *First Report and Order* and refer to the long run incremental cost of a network element as its TELRIC, or Total Element Long Run Incremental Cost. We use the term TSLRIC to refer to the long run incremental cost of a particular retail service, e.g., single-line business service. We note that the Kaserman Report applies the TSLRIC terminology when referencing the costs of unbundled network elements.

(3) Accordingly, both parties agree that the price of unbundled network services should equal TELRIC plus some amount, X, but they do not agree on what X should be. The size of X varies in the various proposals from zero (from the point of view of AT&T) to market-determined opportunity cost (from the point of view of GTE). This report will establish the economic foundation for pricing at TELRIC plus opportunity cost.

(4) While both parties agree that pricing of resale services should equal the retail rate minus avoided retail costs as directed by the *Act*, AT&T further proposes to subtract alleged "product inefficiencies" and "excess profit" and to exclude wholesaling costs. Moreover, AT&T asserts that per-unit avoided costs should be calculated based on the unrealistic assumption that GTE ceases to provide retail services. GTE maintains that net avoided retail costs (that is, avoided retail costs net of any additional wholesale costs) should be the discount and the size of the discount should be determined on the basis of a reasonable projection of the amount of retail services that GTE will no longer provide as a result of reseller entry. This report will show that a discount equal to net avoided retail costs is the economically correct discount.

Our report demonstrates that prices for resale and unbundled network services should be set according to the Market-Determined Efficient Component Pricing Rule ("M-ECPR"). The rule satisfies the FCC's recommendation that prices for resale and unbundled network elements be a based on forward-looking costs. Moreover, when combined with a system of competitively neutral end-user charges, it satisfies the requirements of Congress that prices be based on costs and allow for a reasonable profit. We emphasize at the outset that the M-ECPR differs from the FCC's description of the efficient component-pricing rule in the *First Report and Order*, which, to avoid confusion, we label the FCC-ECPR. Unlike the simplistic FCC-ECPR, however, the M-ECPR takes full account of competitive entry when setting prices for unbundled network elements. In that respect, the M-ECPR benefits consumers and avoids all of the shortcomings that the FCC attributed to the FCC-ECPR.

We explain that setting prices equal to TELRIC (hereinafter referred to as "TELRIC pricing") is inappropriate for pricing resale

and unbundled network services because it removes the local exchange carrier's opportunity to earn revenues that cover its costs, since TELRIC does not include the firm's shared costs and common costs. TELRIC pricing is likely to create cross subsidies as groups of services will fail the "incremental cost" test. Moreover, rigidly imposed TELRIC pricing does not allow the prices of the incumbent LEC to adjust to market conditions. We demonstrate that adopting arbitrary uniform markups above TELRIC would also be an inappropriate pricing policy. By basing the prices of resale and unbundled network services on economic costs, and correspondingly, by taking into account the economic costs of unbundling and interconnection in their rulemaking, regulatory commissions will allow competitive markets to function efficiently.

Our report proceeds as follows. In Chapter II, we respond to the Kaserman Report's claim that competition in local exchange markets needs to be "enabled" and "promoted." We demonstrate that market incentives are sufficient to allow competition to flourish. In contrast, if regulatory commissions act in a partial manner either by picking winners or protecting less successful firms from their own inefficiency, the benefits of competition will be seriously diminished. We also show that economic efficiency requires that regulatory commissions not pursue excessive or unlimited unbundling requirements. That is, unbundling should not be used as a means of creating competitive disadvantages for incumbent providers of network elements, nor should competitive entrants offer services based on free riding on LEC facilities.

Chapter III presents a general framework for pricing inputs sold to competitors in an efficient and compensatory fashion. In particular, we illustrate that the Market-Determined Efficient Component Pricing Rule provides a unified framework for pricing wholesale and unbundled network services.

Chapter IV applies the M-ECPR to calculate wholesale prices for residential and business services. Chapter V applies M-ECPR to calculate prices for unbundled loops and ports.

Chapter VI discusses that economic problems that are avoided when M-ECPR pricing is applied. The chapter responds to the criticisms of the efficient component pricing raised by the Kaserman Report. We illustrate that the Kaserman Report does not address M-ECPR pricing, and, as a result misinterprets the efficiency and compensatory aspects of the rule.

Chapter VII responds to the claim that the principal authors of the rule, Professors Baumol and Willig, repudiated the M-ECPR in favor of TELRIC pricing.

Chapter VIII outlines why M-ECPR is the appropriate rule for the establishment of prices for resale and unbundled network services.

Chapter IX demonstrates that the M-ECPR is not merely the economic prescription for the pricing of wholesale and unbundled services, but is also the rule that produces, under specific conditions, the level of compensation that is sufficient to avoid a government taking of the incumbent LEC's property.

Chapter X demonstrates that the Kaserman Report's adjusted form of M-ECPR pricing for wholesale services, the Avoided Cost Pricing Rule (ACPR), is unworkable and will lead to economic inefficiencies. Implementing ACPR would require a rebirth of cost-of-service regulation, which would retard greatly the growth of competition in the telecommunications industry.

Chapter XI demonstrates that the Kaserman Report's TSLRIC pricing proposal for unbundled network elements is overly simplistic, misrepresents the firm's economic costs, creates economic inefficiency, and should not be confused with competitive pricing.

Chapter XII demonstrates that the FCC's August 1996 *First Report and Order* effects a taking because it denies any recovery of the incumbent LEC's historical costs and ensures that full recovery of its forward-looking costs will be impossible to achieve.

Chapter XIII presents an alternative to M-ECPR pricing for unbundled network elements using guidelines recommended in the FCC's *First Report and Order*. The methodology establishes unbundled network prices equal to TELRIC plus a "reasonable" share of forward-looking common costs using a fully distributed cost allocation methodology referred to as the "fixed factor" or percentage markup method. We explicitly do not endorse the FCC's fully distributed cost method for allocating forward-looking common costs. However, even though highly flawed and inferior to M-ECPR as a pricing methodology, that method at least assigns some forward-looking common costs, unlike the Kaserman Report which merely assumes away all such common costs.

# II

# Regulation Should Recede as Competition Progresses

In their report, Professor Kaserman, et al. allege that there is "significant monopoly power" in the local exchange market, and that the current system of regulation is "cumbersome and expensive." "As a result," they assert, "the benefits to consumers of policies that will successfully promote competition in [the local exchange market] are likely to be substantial." To "promote competition" they make recommendations regarding (1) pricing, (2) the non-price conditions of sale, and (3) the need to "safeguard the competitive process."

Is their assertion correct? Is their analysis of local exchange markets accurate in light of market conditions, telecommunications technology, and economic analysis? Are the policy recommendations they make justified based on economic analysis and regulatory objectives? We investigate the answers to these questions in this chapter.

## A. THE REGULATORY COMMISSION DOES NOT NEED TO PROTECT COMPETITORS OR MANAGE COMPETITION IN LOCAL EXCHANGE TELECOMMUNICATIONS MARKETS

There is no need for a regulatory commission to "promote" competition because the returns expected to be earned by firms from serving customers provide sufficient incentives for them to compete in the provision of telecommunications services. Indeed, attempts to manage or direct competition not only entail administrative costs but can

prevent the market from achieving the benefits of competition that the Commission wishes to attain.

There is no need for a commission to "protect" or "safeguard" competition. Market incentives are sufficient to allow competition to flourish. If the Commission acts in a partial manner either by picking winners or protecting less successful firms from their own inefficiency, the benefits of competition will be seriously diminished. Moreover, antitrust law serves to protect competition from monopolization and other anticompetitive practices. Regulatory attempts to supplant this role of antitrust would if anything preempt its proper functioning.

Federal and state efforts to open local exchange telecommunications markets to competition is clearly a good policy. Indeed, competition is desirable in local exchange telecommunications for the same reasons that it is desirable in any market. Competitive markets are the preferable economic mechanism for achieving allocative, productive, and dynamic efficiency. Allocative efficiency is achieved when goods and services are allocated to the uses in which they have the highest value. Productive efficiency is achieved when goods and services are used by producers in such a manner as to minimize costs subject to technological constraints. Dynamic efficiency refers to decisions made over time, including efficiencies in investment and technological innovation.

However, the Kaserman Report puts forward a prescription for effectuating these policies that is misguided. What the authors are recommending is designed to promote competitors -- not competition. Markets tend to achieve efficient allocations of resources as a result of competition among firms. Firms compete by offering lower prices, improvements on products and services, customer convenience, product variety, and marketing and sales services. When companies offer similar products to their customers, competition tends to lower prices towards production costs as firms bid against each other to make sales to customers. Firms face competition from other firms operating in the same market, from firms that offer substitutes for their products, and from potential entrants who will respond to the perceived needs of consumers. All of this happens because consumers seek to maximize their well-being subject to their budgets and because firms seek to maximize their profit. This is the sense in which Adam Smith in *The Wealth of Nations* (1776) spoke of an "invisible hand" that guides every individual so that "[b]y pursuing his own interest he

frequently promotes that of the society more effectually than when he really intends to promote it."[1]

Competitive markets are preferable to government allocation of goods and services because they produce economic transactions at the lowest possible cost, allowing individual customers and competitors the freedom to make economic choices. Economic analysis and historical experience conclusively demonstrate that even with their imperfections, competitive markets outperform governments as an economic allocation mechanism. Competition is the best mechanism for stimulating research and development and for resolving uncertainty about evolving technology. Technological change and uncertainty are present in telecommunications. Markets process large quantities of information, which necessarily would overwhelm any central economic planner. Experience in regulated markets (from airlines, to railroads, to natural gas) confirms that pricing regulation and other command-and-control restrictions by regulatory authorities is associated with prohibitively high administrative costs and economically inefficient allocation of resources.

In the name of promoting competition, the Kaserman Report recommends just the opposite, that is, increased regulatory intervention in local exchange telecommunications markets. While singing the praises of competition and the market, new forms of regulation are recommended on a scale unprecedented in the utility industry, or in fact in any U.S. industry. The authors' proposals would involve an indefinite extension of regulation to markets for resale and unbundled network services, supplanting the determination of pricing and service offerings by firms competing in the market. That is, they advocate the extension of regulation beyond the current system involving final telecommunications services to include a new system that controls the underlying factors of production. In their view, state regulators should determine how productive inputs should be priced, how these inputs should be provided, and how they should be employed in the production of telecommunications services. Thus, telecommunications regulation is to be expanded to include control of technology, capital equipment, and other productive inputs. This represents a significant and qualitative extension of regulation from outputs to productive inputs.

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1. ADAM SMITH, THE WEALTH OF NATIONS (The Modern Library 1937) at 423.

In a previous proceeding in California, an author of the Kaserman Report, Professor Mayo, advanced the proposition that regulatory authorities should seek to implement regulations that achieve competitive outcomes. For example, he opined that

> A primary goal of public utility pricing is to achieve an allocation of resources similar to that which would result in competitive markets. Because effectively competitive markets automatically generate efficient prices (the fundamental virtue of the invisible hand), it is essential that regulators understand the basic characteristics of such prices if they are to replicate competitive outcomes in regulated markets.[2]

Thus, in Professor Mayo's view, regulation of telecommunications markets should seek to achieve an outcome similar to that which would be observed in a competitive market. The competitive outcome is to be achieved not by letting the forces of competition operate freely, but rather by some as yet unspecified system of government "replication." This assertion raises two fundamental questions.

First, is a competitive allocation of resources the primary goal of regulators? There are many reasons to doubt the validity of this proposition. Economic analysis establishes that cross subsidies in the prices offered by a company cannot survive in a competitive market. No firm would voluntarily cross-subsidize its own product offerings since it would have an incentive to exit from offering services whose incremental revenues did not cover their incremental costs. Moreover, the firm would lose customers of those services providing cross subsidies to competitive entrants. However, regulated markets are quite different from competitive markets in that they commonly involve cross subsidies, as regulators seek to achieve perceived fairness and other social objectives, such as universal service. For example, regulated prices for telecommunications services in most states are characterized by cross subsidies due to geographic rate averaging, subsidies from business to residential customers, and subsidies from vertical services to basic services.

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2. Opening Testimony of Dr. John Mayo on behalf of AT&T Communications of California, Inc., California Public Utilities Commission, Docket Nos. R.93-04-003 and I.93-04-002, June 14, 1996, at 24.

Second, could regulators "replicate" competitive outcomes in regulated markets even if they were inclined to do so? Competitive markets require continual adjustment of prices and product offerings to changes in customer tastes, incomes, and technological innovation. The informational requirements of such adjustments are not compatible with the costly and difficult administrative procedures that regulatory rulemaking requires. Regulators cannot be expected to react to, let alone anticipate, changes in customer preferences and supplier technology. Transaction costs and information processing costs make it unworkable for regulators to attempt to supplant or recreate competitive outcomes. To suggest that regulators can replicate the "invisible hand" of the market, as does Professor Mayo, fundamentally contradicts Adam Smith's original point (on the same page of *The Wealth of Nations*) that policy makers should not interfere in the functioning of competition:

> The statesman, who should attempt to direct private people in what manner they ought to employ their capitals, would not only load himself with a most unnecessary attention, but assume an authority which could safely be trusted, not only to no single person, but to no council or senate whatever, and which would nowhere be so dangerous as in the hands of a man who had folly and presumption enough to fancy himself fit to exercise it.[3]

Rather than attempting to replicate the market, regulators surely recognize that achieving market outcomes requires taking steps to remove regulatory restrictions, as telecommunications markets continue to become increasingly competitive. The achievement of market outcomes does not come from expanding the scope of regulation, as the Kaserman Report recommends. Excessive regulation can discourage innovation and capital investment, thus locking in obsolete technologies.

If the regulatory commission opens local exchange markets to competition, and establishes unbiased rules that allow entrants and incumbents an equal opportunity to compete, it then can rely on market incentives to do the job. Firms compete where they discern opportunities for profit. They compete by investment in facilities to produce goods and services. They compete by process innovations so

3. *Supra* note 1.

that prices can be lower than competitors. They compete by research and development to provide improvements and innovations in existing products and services. They compete by differentiating their product offerings from their rivals. Competition takes place in markets without the need for government promotion. Rather, it is the natural outcome of private companies seeking to obtain a competitive return on the investment of their owners or shareholders. There is no more a need for the government actively to promote competition than there is a need for it to exhort Olympic athletes to remember to compete with each other. Competition occurs because of the economic rewards that firms obtain by satisfying the demands of their customers.

The Kaserman Report argues that telecommunications is different from other industries because incumbent LECs have been subject to a regulated monopoly and because competition in local exchange markets is "nascent." These assertions are incorrect. Whether the LECs have held a regulated monopoly in the past is not an indicator that competition must be "enabled" or that actions to "promote" competition are needed. Indeed, assuming for the purposes of argument, that the LECs were to act like classical monopolists, and to hold back their services, increase prices substantially, and reduce the quality of customer service, these activities provide increased incentives for the entry of new competitors. Past monopoly, far from being a hindrance to competition, is an important stimulus to competition, as entrants seek to bid away customers by outperforming the pricing, product availability, and quality of service of the monopolist. Past monopoly requires no corrective action by regulators to subsidize, support, or otherwise promote competitors.

Students of economic history will undoubtedly recognize the notion of "nascent competition" as the "infant industry" argument, employed to prevent competition in international trade. The infant industry argument is advanced by those who believe that domestic industry should be subsidized and otherwise protected from international competitors until it grows sufficiently. This argument has little merit, and it certainly does not apply in telecommunications. AT&T, MCI, Sprint, Time Warner and other entrants are no infants! These are large, well-established, well-funded, and innovative companies. These companies are experienced in telecommunications, and their competitive efforts are far from nascent. They do not need subsidies, assistance, or special privileges. Even relative newcomers to telecommunications are perfectly capable of purchasing the requisite equipment and obtaining the required technological and marketing expertise to carry out their objectives.

Moreover, even if an infant industry argument were applicable for telecommunications (which it decidedly is not), when do such advantages for the competitors of the LEC cease? How would their duration be specified in advance? The recommendations for regulatory promotion of competition appear to create open-ended commitments for the Commission. Such open-ended commitments are not designed to let regulation recede as competition increases.

Forcing incumbent LEC prices below their economic costs of selling to competitors (incremental plus opportunity costs), results in a transfer of income from the LEC to its competitors. Such pricing is neither efficient nor compensatory. Efficiency requires that the LEC price inputs sold to competitors at its economic costs. Compensatory pricing requires that the revenues from these inputs make some contribution to shared costs and common costs. When there is no competitive alternative, the contribution can be capped based on regulated revenues. When there are competitive alternatives, they can determine the market-allowed contribution.

Policies to "promote" competition and establish prices for resale and unbundled network services do not in themselves serve to increase competition, and instead may hinder competition. The point of competition is that the market discovers prices. Regulating prices constrains competition by interfering with the competitive process of firms as they bid against each other to serve their customers. For regulators accurately to determine the prices that competition produces presumes that the underlying determinants of pricing - including demand, costs, technology, product features, and competitive strategy - are foreseeable. The objective of regulatory commissions should be to follow an initial pricing method that can respond dynamically to competition, with the initial prices serving as price caps.

### B. REGULATORY COMMISSIONS DO NOT NEED TO EXPLICITLY SAFEGUARD COMPETITION IN LOCAL EXCHANGE TELECOMMUNICATIONS MARKETS

The best protection for competition is for regulatory commissions to allow all parties an equal opportunity to compete. Thus, the best protection for competition is reduction of regulatory oversight, allowing businesses to be guided by market incentives.

Technological changes and industry developments show that local exchanges are lacking in monopoly power.[4] The local loop is not

4. Daniel F. Spulber, *Deregulating Telecommunications*, 12 YALE J. ON REG. 25

an essential facility since many alternatives are available to the existing local exchange network. Alternative technologies available include coaxial cable, fiber optics, and wireless technologies such as cellular and microwave. It is clearly feasible to construct alternative transmission facilities to compete with local exchange networks. Successful entry into the local loop has already occurred, showing that it is both technically and economically feasible to compete with the local exchange network. In addition, equal-access provisions and regulation undercut arguments that an incumbent could use an essential facility to leverage monopoly power into competitive services.

Even if it could be established that local competition was insufficient, the mere possibility of some amount of "market power" in the local exchange cannot justify placing onerous pricing and unbundling regulations on incumbent LECs. Market power gives a firm some ability to increase or lower its sales by varying its price, rather than taking as given an external market price. In markets where there are not a very large number of firms, or where products are differentiated, each firm has some market power, limited only by the types of actual and potential competition that it faces. Most companies have market power in the sense that they can vary some of their prices and face price-responsive customer demand (that is, downward-sloping demand functions). No one would seriously suggest that pricing and unbundling regulations should be applied to all such companies. Given the alternatives available and the unbundling and resale obligations, market power in the local exchange (if any) will not be significant enough to justify creating new forms of regulation that asymmetrically affect incumbents and entrants.

The Kaserman Report's concern with monopoly leveraging has no basis. If there is no monopoly position to begin with, then there can be no monopoly leveraging. The leverage scenario is inconsistent with incentives that have been created by competition in the local exchange.

Even assuming that a monopoly position exists, there remains the question of whether firms have an economic incentive to engage in monopoly leveraging. Under general conditions, firms do not have an incentive to engage in "leveraging" market power, whether through vertical foreclosures or tying products. As Judge Richard A. Posner has observed, "[o]ne striking deficiency of the traditional, 'leverage' theory of tie-ins, as the courts have applied it, is the failure to require any proof that a monopoly of the tied product is even a remotely

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(1995).

plausible consequence of the tie-in."[5]

The long established view in economics on tie-in sales as a form of monopoly leveraging is quite to the contrary. Economic analysis has established that for a firm selling complementary goods in fixed proportion, with a monopoly in the tying good and a competitive market in the tied good, monopoly profits cannot be increased beyond those already available in selling the tying good. Creating a second monopoly in the tied good will not increase profits, since earnings are constrained by competitive alternatives in the market for the tied good.[6]

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5. RICHARD A. POSNER, ANTITRUST LAW: AN ECONOMIC PERSPECTIVE (Chicago University Press 1976) at 172.

6. This classic result is confirmed and extended in an article by Michael Whinston on the theoretical basis for monopoly leveraging, see Michael Whinston, *Tying, Foreclosure, and Exclusion*, 80 AMER. ECON. REV. (March 1990) at 837-859. Whinston shows that the monopolist does not have an incentive to leverage even with differentiated products in the tied-goods market, with economies of scale in production, and with oligopolistic, rather than a competitive, market structure in the tied-goods market. As Whinston observes:

> The key point is that with complementary products used in fixed proportions, the monopolist can actually derive *greater* profits when its rival is in the market than when it is not because it can benefit through sales of its monopolized product from the additional surplus that its rival's presence generates (due to product differentiation).

Thus, when Whinston assumes that the tying good is an essential facility, and there are two firms in the tied good market, he finds that it is not profitable for firm 1 to drive firm 2 out of business in the tied good market, consistent with the conventional result that monopoly leveraging is not possible. To place this result in the context of telecommunications, whether monopolist or not, the LEC's sales of local exchange services could benefit from increased demand for the services that are complementary to those offered by its competitors

There are special situations where tying can be profitable. For example, bundling may be desirable if the tie-in sale allows usage-based pricing by using the tied good to monitor customer demand for the tying good. In the case of telecommunications, local exchange carriers clearly have the capability to monitor demand for local service without resorting to tie-in sales, so that such a motive for tying is absent. Price regulation may affect incentives for tie-in sales, however, if there is competition in the tied good market, then raising the price of the tied good above the competitive level will reduce the demand for the tying good, thereby reducing profits.

The basic argument that a monopoly cannot increase its profits by creating a second monopoly in a complementary good when the goods are sold in fixed proportion continues to hold. What critics of the argument have done is create highly stylized conditions to show that starting from a non-monopoly position, in the tying and tied-goods markets, profits can be increased by forcing rivals out until a monopoly position is obtained. For example, when Whinston assumes that there is monopoly in the tying good and there is a single rival in the tied-goods market, and

Thus, monopoly leveraging generally is not possible through tie-in or bundled sales in telecommunications. In addition, tie-in sales or bundling is not *per se* anticompetitive. Bundling may be the lowest cost, most efficient method of providing and distributing various services. For example, it is more efficient to sell a fully assembled automobile than to require that consumers purchase unbundled components like wheels, brakes, engines, etc. for self-assembly. Forcing firms to unbundle all services and preventing them from offering bundled services may well increase costs to consumers. If unbundling is forced on service providers, then customers should have the option of choosing between purchasing services on an unbundled or bundled basis. Whichever basis offers them the best value should be the customer's choice. The LEC must be given the pricing flexibility to compete in good faith and to bargain with customers and competitors purchasing its services so that prices and services may be customized.

### C. EXCESSIVE UNBUNDLING SHOULD BE AVOIDED BECAUSE IT IS COSTLY TO SOCIETY

Regulatory commissions should not impose excessive unbundling and resale requirements on the LECs. The reason for this is that unbundling and resale entail economic costs, both direct production costs and transaction costs. Therefore, taking into account that implementing unbundling and wholesale transactions entails costs means that unlimited unbundling cannot possibly be desirable. The higher are such costs, the less unbundling is socially desirable. Even if unbundling were to create the competitive benefits that its advocates believe, there is a tradeoff between the benefits and costs of unbundling. Unbundling is not a free lunch, and shifting the costs onto the LECs does not make it so.

The costs of unbundling, if not recovered, would place the incumbent LECs at a competitive disadvantage, thereby reducing the desired benefits of competition. Such extreme unbundling, moreover, is not necessary to achieve the regulatory objectives since they are best

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that rival produces an inferior good, he finds that the firm offering bundled service could drive the producer of the inferior product out of business. This result is not applicable to telecommunications. It only would apply if one believed that (1) the LEC faced no facilities-based competitors for unbundled network services, (2) the LEC faced only one competitor in the market for resale services, local toll, or long distance, and (3) the sole competitor produced an inferior product. These conditions do not hold for the local telecommunications markets.

attained by standardized unbundling requirements for resale and network elements. In combination with TELRIC prices, which would cause competitors not to bear these costs of unbundling, unbundling to the maximum extent feasible would encourage free riding by competitors on the LEC's networks. This would not encourage efficient entry and investment.

Regulatory commissions should set out the minimum extent of unbundling to achieve its objectives of competition in resale and unbundled network elements. In the interest of competition, commissions should rely on the market to determine the efficient level of product and service combinations and unbundling. Entrants should not just request unbundling as a substitute for or subsidy to their investment projects, but rather should bear the costs of the unbundling so that their unbundling requests will be economically efficient.

# III

# Definition and Application of the Market-Determined Efficient Component-Pricing Rule

This chapter presents a pricing rule that satisfies the FCC's recommendation that prices for wholesale services and unbundled network elements be based on forward-looking costs. When combined with a system of competitively neutral end-user charges, the rule also satisfies the requirement of Congress that prices be based on costs and allow for a reasonable profit. The rules for the establishment of wholesale prices are set forth in the *Telecommunications Act of 1996* ("*Act*").[1] Section 252(d)(3) of the *Act* concludes that wholesale rates shall be established "on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier."

With respect to establishing prices for unbundled network elements, Section 252(d)(1) of the *Act* states that unbundled network element charges "(A) shall be (i) based on the cost (determined without reference to a rate-based proceeding) of providing the interconnection or network element (whichever is applicable), and (ii) nondiscriminatory, and (B) may include a reasonable profit."[2] The *First Report and Order* sets forth the FCC's implementation of the *Act* generally and Section 252(d)(1) specifically. In particular, the *First Report and Order* concludes "that, under a [Total Element Long Run Incremental Cost] methodology, incumbent LECs' prices for interconnection and unbundled network elements shall recover the

1. *Telecommunications Act of 1996*, Pub. L. No. 104-104, 110 Stat. 56.
2. 47 U.S.C. § 252(d)(1).

forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[3]

In this chapter we discuss the pricing requirements in the *Act* and the *First Report and Order*, and how those requirements are met by our pricing rule. The chapter is organized as follows: Section A presents a brief discussion of the cost and profit concepts used in the *Act* and the *First Report and Order*. In order to appreciate the specific aspects of the FCC's pricing methodology, it is necessary to have an understanding of the economic definitions of these terms. Section B discusses the FCC's pricing methodologies for the establishment of wholesale and unbundled network element prices. Section C reports the calculation of GTE's total element long run incremental costs. Section D presents a method for calculating GTE's forward-looking common costs. Section E presents our pricing methodology and explains why it satisfies all the requirements of Congress, when combined with a system of competitively neutral end-user charges. Section F discusses the economic rationale of the rule, and section G contains our conclusions.

## A. COST AND PROFIT CONCEPTS REFERENCED BY CONGRESS AND THE FCC

The *First Report and Order* makes reference to the following types of costs: total service long run incremental costs; total element long run incremental costs; joint costs; and common costs. The *total service long run incremental cost* (TSLRIC) of a service sold to end users equals the difference in the firm's total costs with and without the provision of that service. In the *First Report and Order* the FCC coined a new term, *total element long run incremental cost* (TELRIC), to refer to those costs that are incremental (or attributable) to individual network elements.[4] A firm's *joint* costs are those costs incurred when two or more services are produced in fixed proportion.[5] A firm's *common* costs are those costs incurred in the provision of some or all the firm's services that are not incremental to any individual service.[6] Hence, common costs only can be avoided only by

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3. *First Report and Order*, at ¶ 682.

4. In this report, we use TELRIC to refer to the long run incremental cost of an unbundled network element, and TSLRIC to refer to the long run incremental cost of a retail service.

5. As the Commission notes, joint costs have the property that "when one product is produced, a second product is generated by the same production process at no additional cost." *First Report and Order*, at ¶ 676.

6. The Commission's definition of common costs includes what are sometimes called *shared* costs. These are costs incurred in the provision of two or more

shutting done the entire firm or by not producing a particular group of services under study. Following the Commission's approach, we use the term *common* costs to refer collectively to all non-incremental costs.[7] In addition, a regulated firm may have *residual* costs caused, for example, by assets that remain on its books even though they have no economic value. The recovery of residual costs can be achieved through a competitively neutral end-user charge.

To illustrate the concepts of incremental and common costs, we provide a simple example. Suppose a street vendor operates a stand and sells both hot dogs and hamburgers. The incremental cost of a hot dog would include the cost to the vendor of the hot dog, hot dog bun, condiments, and propane. Similarly, the incremental cost of the hamburger would include the ground beef, hamburger bun, condiments, and propane. The common costs would include the cost of the grill used to cook the hot dogs and hamburgers, as well as the stand. In the provision of local phone service, common costs include general and administrative costs (e.g., accounting and finance, external relations, and human resources) and support costs, such as general purpose computers. Incremental or attributable costs would include the costs of central office switching, and cable and wire facilities.

Both incremental and common costs necessarily include a cost for the *return on invested capital.* For example, the TSLRIC of a service must include a return on capital sufficient to keep those resources in their current employment. If the return on capital invested to provide a service is below the *competitive or fair rate of return,* the capital market will operate to move those investments to other projects that yield (at least) a competitive return. A competitive or fair rate of return is that return that could be earned on an investment of comparable risk.

Both the *Act* and the *First Report and Order* refer to "profits."[8] A firm earns a "reasonable profit" when its *economic profits* equal zero. Economic profits are zero when total revenues equal total costs, inclusive of a competitive return on capital. The incumbent LEC's return on capital equals the sum of the return on capital for its incremental, joint, and common costs. The statutory "reasonable profit" provision of the Act is implemented, by definition, when the firm's rates are established so that, on average, it earns zero economic profits.[9] That is, the firm's rates should be established so that, on average, it earns zero economic profits. Of course, random

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services (but not the collection of all the firm's services) that are not incremental to any individual service.

7. *First Report and Order*, at ¶ 676.

8. *See* 47 U.S.C. § 252(d)(1) and *First Report and Order, at* ¶ 699.

9. *See* 47 U.S.C. § 252(d)(1).

market factors may cause its profits to exceed or fall below this value in any particular period.

### B. THE FCC'S PRICING RULES FOR RESALE SERVICES AND UNBUNDLED NETWORK ELEMENTS

In this section, we summarize the FCC's rules for the establishment of wholesale prices for resale services and prices for unbundled network elements. With respect to wholesale rates, the FCC adopted the avoided cost approach contained in the *Act*, and discussed how an incumbent carrier's avoided retail costs should be calculated.[10] In Chapter IV, we discuss how our pricing is applied for setting wholesale rates.

With respect to the FCC's recommended pricing rule for unbundled network elements, recall the rule was that "incumbent LECs' prices for interconnection and unbundled network elements shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[11] Thus, the FCC's rule is represented by the following formula:

$$\textit{Price of Unbundled Element} = \textit{TELRIC} + (x)\ (\textit{FLCC})$$

where:

| | |
|---|---|
| *TELRIC* | = Total Element Long Run Incremental Cost; |
| *FLCC* | = Forward Looking Common Costs; and |
| $x$ | = Reasonable share of FLCC allocated to the unbundled network element. |

Below, we discuss each component of the above formula, and illustrate how to determine the reasonable share of forward-looking common costs that can be assigned to each unbundled network element. We call our pricing method the "market-determined efficient component-pricing rule" (M-ECPR). It bears emphasis at the outset that the M-ECPR rule differs from the FCC's defined rule (which we term FCC-ECPR), which the agency rejected. For example, as explained in Chapter V, the M-ECPR and FCC-ECPR methodologies yield the following prices for an unbundled loop:

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10. *First Report and Order*, at ¶¶ 907-934.
11. *First Report and Order*, at ¶ 682.

- M-ECPR – the price of an unbundled loop equals approximately $33 per line per month; and
- FCC-ECPR – the price of an unbundled loop equals approximately $65 per line per month.[12]

Thus, the two methods yield substantially different prices. The reason for the difference is that the M-ECPR takes into account market alternatives, both actual and potential, while the FCC-ECPR does not (see discussion below). Unlike the simplistic FCC-ECPR rule the FCC faulted for being based on retail rates that are not "cost based," the M-ECPR takes market alternatives into account and allows prices to move to competitive levels. In that respect, the M-ECPR benefits consumers by promoting economic efficiency; and avoids the shortcomings that the FCC attributed to the FCC-ECPR rule.

### C. CALCULATING TOTAL ELEMENT LONG RUN INCREMENTAL COSTS

In its *First Report and Order* the FCC coined the phase "Total Element Long Run Incremental Cost" to describe the forward-looking total costs attributable to an unbundled network element. More specifically, the *First Report and Order* defines TELRIC as "the forward-looking cost over the long run of the total quantity of the facilities and functions that are directly attributable to, or reasonably identifiable as incremental to, such element, calculated taking as given the incumbent LEC's provision of other elements."[13] The network elements listed in the *First Report and Order* are as follows:

(1) local loops;
(2) local switching;
(3) dedicated transmission links;
(4) shared transmission facilities between tandem switches and end offices;
(5) tandem switching;
(6) signaling and call-related database services; and
(7) collocation.

GTE estimated its TELRICs following the methodology in the *First Report and Order*. In particular, the TELRICs were calculated assuming the use of the most efficient technology deployed in its existing wire centers. This calculation follows the methodology

12. For an average business customer.

13. 47 C.F.R. § 51.505(b), in *First Report and Order*, Appendix B, at B-29 to B-30.

established in the *First Report and Order.*[14] In addition, GTE's calculations (1) assumed that in the long run, all costs were avoidable; (2) excluded common costs; and (3) utilized the cost causation principle, which states that costs caused by the provision of a given network element should be attributable to that element.

### D. CALCULATING FORWARD-LOOKING COMMON COSTS

A key aspect of the methodology in the *First Report and Order* is the estimation of an incumbent local exchange carrier's forward-looking common costs. The *First Report and Order* defines forward-looking common costs as "economic costs efficiently incurred in providing a group of elements or services (which may include all elements or services provided by the incumbent LEC) that cannot be attributed directly to individual elements or services."[15]

A firm's forward-looking common costs are defined as (1) its forward-looking total costs minus (2) its forward-looking attributable costs (equivalently, the sum of the network element TELRICs). GTE's forward-looking total costs can be estimated based on the firm's current revenues. Such an approach is based on economic principles of regulated firms. Regulation allows firms the opportunity to earn a fair return on their invested capital.[16] This principle has two important implications:

- In long-run market equilibrium, regulated firms do not earn positive economic profits; and

- In long-run market equilibrium, regulated firms are not forced to earn negative economic profits.

Thus, regulation provides a firm with sufficient cash flows to replace depreciated capital and cover its current operating costs, but the cash flows are constrained so as to prevent the firm from earning positive economic profits. The cash flows of a regulated firm must

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14. *First Report and Order*, at ¶ 685 ("We . . . conclude that the forward-looking pricing methodology for interconnection and unbundled network elements should be based on costs that assume that wire centers will be placed at the incumbent LECs current wire center locations, but that the reconstructed local network will employ the most efficient technology for reasonably foreseeable capacity requirements.").

15. 47 C.F.R. § 51.505(b), in *First Report and Order*, Appendix B, at B-29 to B-30.

16. *See, e.g.,* Leland, H. (1974), *Regulation of Natural Monopolies and the Fair Rate of Return,* 5 Bell Journal of Economics 3; and Greenwald, B. (1984), *Rate Base Selection and the Structure of Regulation,* 15 RAND JOURNAL OF ECONOMICS 85.

allow it to recover its capital costs on a going-forward basis, that is, not just on an historic basis. In other words, the regulated firm's cash flows must be large enough to replace its capital over time. Thus, a regulated firm's rates of return and depreciation are adjusted so that its cash flows approximately equal those that would result from the use of replacement costs rather than book costs for its invested capital. Of course, replacement costs may vary from book costs because of (1) inflation, (2) changes in relative input prices (e.g., rising labor rates or falling capital costs), and (3) changes in technology. A regulated firm's cash flows should approximate the same cash flows that would result from an explicit, forward-looking calculation of capital costs and operating costs.

For these reasons, a regulated carrier's forward-looking total costs should approximately equal its current annual revenues (as shown in Table III-1). In the current context, GTE's annual revenues equal $1,269.1 million. From GTE's annual revenues, we subtract the sum of its TSLRICs in order to obtain the estimate of forward-looking common costs. Thus, the forward-looking common costs are estimated to equal $500.1 million, i.e., the current annual revenues of $1,269.1 million minus the sum of the TSLRICs of $769.0 million. This illustrates that GTE's forward-looking common costs are substantial. In particular, the estimate of forward-looking total costs exceeds attributable costs by a substantial percentage so that, as shown below, this results in prices for unbundled network elements in excess of TELRIC.

TABLE III-1
ESTIMATE OF FORWARD-LOOKING COMMON COSTS
USING CURRENT TOTAL REVENUE AND ATTRIBUTABLE COSTS
(MILLIONS OF DOLLARS)

| | Revenue | TSLRIC[1] | Contribution |
|---|---|---|---|
| Local | | | |
| Residence | $274.5 | $420.2 | ($145.7) |
| Business | 250.2 | 142.1 | 108.1 |
| Other | 50.9 | 4.6 | 46.3 |
| Total Local[2] | $575.6 | $566.9 | $8.7 |
| IntraLATA Toll | 53.8 | 5.7 | 48.1 |
| Switched Access | 320.9 | 32.5 | 288.4 |
| Special Access[3] | 13.8 | 12.8 | 1.0 |
| Other | 305.0 | 151.1 | 153.9 |
| Total | $1,269.1 | $769.0 | $500.1 |

Notes:
[1] Total Service Long-Run Incremental Cost.
[2] Excludes other miscellaneous local services.
[3] Excludes transport and supplemental features.

## E. DETERMINING THE REASONABLE SHARE OF FORWARD-LOOKING COMMON COSTS TO ALLOCATE TO INDIVIDUAL UNBUNDLED NETWORK ELEMENTS

Given the existence of GTE's forward-looking common costs, we now explain how the M-ECPR methodology fairly allocates those costs in accordance with the recommendations of the *First Report and Order*. Recall that the *Order* states "that, under a [Total Element Long Run Incremental Cost] methodology, incumbent LECs' prices for interconnection and unbundled network elements shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[17] The *First Report and Order* defines a "reasonable allocation" as follows:

> The sum of a reasonable allocation of forward-looking common costs and the total element long-run incremental cost of an element shall not exceed the stand-alone cost associated with the element. In this context, stand-alone costs are the total forward-looking costs, including corporate costs, that would be incurred to produce a given element if that element were provided by an efficient firm that produced nothing but the given element.[18]

As discussed in detail below, the M-ECPR method establishes prices for unbundled network elements as equal to the sum of the carrier's (1) direct economic costs and (2) opportunity costs. The opportunity costs of providing an unbundled network element equal (1) the revenues that can be generated by the use of that element given the presence of all market alternatives minus (2) the direct economic costs. Thus, the opportunity cost of a product or input equals its value in its *best alternative use*. (Therefore, opportunity costs by definition are forward looking.)

In economics, there is no dispute as to the definition of opportunity costs. The consensus position has been stated by, for example, Professors Kaserman and Mayo as follows:

> The economic concept of costs includes the value of all inputs required for production, including the implicit value of those inputs owned by the producer. . . . Thus, economic costs include both implicit and

17. *First Report and Order*, at ¶ 682.

18. 47 C.F.R. § 51.505(c)(1), in *First Report and Order*, Appendix B, at B-30.

> explicit costs. . . . Implicit costs are defined as the opportunity cost of owned resources, where the term *opportunity cost*, in turn, is defined as the value of a resource in its best alternative use. Explicit costs are the out-of-pocket expenditures on inputs purchased by the firm (which, in the short run, include both fixed and variable inputs).[19]

We stress that this definition of opportunity costs, which is the standard economic definition, is *not* the definition used by the Commission in its *First Report and Order*. The FCC-opportunity costs were defined as "the revenues that the incumbent LEC would have received for the sale of telecommunications services, in the absence of competition from telecommunications carrier (sic) that purchase elements."[20] The Commission's definition, thus, explicitly assumed away competition, whereas the standard economic definition takes as given all competitive options.

Of course, in calculating the opportunity costs, the revenues that can be generated by the use of an unbundled network element depend on whether there are market alternatives for the incumbent LEC's retail services and unbundled network elements. The magnitude of the incumbent's opportunity costs depends on whether such market alternatives are present or absent. There are, therefore, two cases to consider in the calculation of opportunity costs for an unbundled network element:

> *Market alternatives are absent* – Opportunity costs equal (1) the revenues currently generated in retail rates for services provided through the use of that element minus (2) the direct economic costs of the unbundled network element. In this case, the incumbent recovers the same flow of contributions embodied in the existing rate structure.

> *Market alternatives are present* – Opportunity costs equal (1) the revenues that can be obtained in the market through the use of that element minus (2) the direct economic costs of the unbundled network element. In this case the presence of facilities-based entry and the possibility that entrants may purchase services under existing retail rates that are substitutes for the incumbent carriers' unbundled network elements reduces the likelihood that the incumbent will recover

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19. Kaserman, D. and Mayo, J. (1995), GOVERNMENT AND BUSINESS: THE ECONOMICS OF ANTITRUST AND REGULATION, New York, NY: Dryden Press, at 32.

20. 47 C.F.R. § 51.505(c)(1), in *First Report and Order*, Appendix B, at B-30.

its total costs. Also, by cutting its price, a resale-based competitor can reduce the M-ECPR. These forces will necessarily reduce the flow of contributions embodied in GTE's existing rate structure.

The *First Report and Order* only discussed efficient component pricing in the circumstance in which no price competition exists. Thus, the FCC stated: "The opportunity cost, which is computed as revenues less all incremental costs, represents both profit and contribution to common costs of the incumbent, *given the existing retail prices of the services being sold.*"[21] On the basis of that incorrect definition of opportunity costs, the FCC found: "We conclude that [FCC-ECPR] is an improper method for setting prices of interconnection and unbundled network elements because the existing retail prices that would be used to compute incremental opportunity costs under [FCC-ECPR] are not cost-based. Moreover, the [FCC-ECPR] does not provide any mechanism for moving prices towards competitive levels; it simply takes prices as given."[22]

The FCC's conclusions follow directly from its incorrect definition of opportunity costs. By ignoring the presence of market substitutes, the FCC found that the efficient component pricing rule provides no "mechanism for moving prices towards competitive levels." But by no means is this the case. The FCC managed to obtain the exact opposite of the correct answer by ignoring fundamental market forces. In contrast, by carefully considering all available market alternatives, the M-ECPR forces rates down where opportunity costs fall as a result of the presence of substitute services. Far from taking "prices as given," the M-ECPR recognizes that an incumbent carrier's ability to sell retail services at existing retail prices depends entirely on whether entrants offer lower prices. If such lower prices are forthcoming in the marketplace, the incumbent carrier's opportunity costs fall, causing the corresponding efficient component rates to fall as well. In sum, the FCC set up a "strawman" version of ECPR in its *First Report and Order* and proceeded to knock it down.

The M-ECPR method is consistent with the FCC's discussion of how forward-looking joint and common costs should be recovered. After discussing various "reasonable allocation" methods, the *First Report and Order* concluded: "In no instance should prices exceed the stand-alone cost for a specific element, and in most cases they should be below stand-alone costs."[23] Of course, that outcome is precisely what the M-ECPR method accomplishes when it examines market

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21. *First Report and Order* ¶ (emphasis added).
22. *Id.*
23. *Id.*

alternatives. If, for example, an entrant's stand-alone cost of supplying network elements were less than the incumbent's existing wholesale rate, that condition would limit the incumbent's existing opportunity costs of the unbundled network element to the stand-alone cost of the entrant.

### F. WHAT IS THE ECONOMIC RATIONALE FOR THE MARKET-DETERMINED EFFICIENT COMPONENT-PRICING RULE?

The M-ECPR sets prices for resale services and unbundled network elements in the manner specified by the *Act* and the *First Report and Order*, which is the same way that firms and markets determine such prices. How do companies determine the economic costs of their inputs in practice? Some inputs are purchased on the market. For these inputs the determination of opportunity costs is straightforward since it equals the purchase cost of that input. The market price of the product or service provides the best guide to the economic value of that service because it results from fundamental supply and demand forces. Consumers' willingness to pay and suppliers' costs are reflected in the price that clears the market.[24]

But not all inputs used by a company are easily purchased in the market place. For those inputs that are not purchased it is necessary to "impute" their cost, that is, to attribute to that input the value in its best alternative use. When an input is unique to the company or produced by the company itself, the economically correct price is the best alternative use of that input. Thus, if an owner-manager of a small business puts in time operating the business, the opportunity cost of her time to the business is the best return that she could obtain elsewhere.

The M-ECPR calculates the prices that reflect market opportunities. The M-ECPR is a public-interest approach to the problem of how a regulated firm should price unbundled network elements it sells to a competitor. If a company produces an input and sells that input to another company, what would be the economic cost of that input? In this case, the economic cost would equal the direct cost of making that input plus the earnings forgone elsewhere by

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24. In a competitive market, the prices for products and services generally reflect their economic cost. If prices do not generate sufficient revenues to cover costs, firms do not have an incentive to provide those products and services. If prices generate revenues that are above costs, price competition between providers and entry of new providers will drive down prices. In a competitive market, price always includes compensation for such economic costs – for example, for the interest forgone by the firm when it supplies funds from retained earnings rather than borrowing them from a bank.

making the sale. In other words, the economic cost of the input to be sold to another company is the direct cost of making the input *plus* the opportunity forgone by making the sale. This economic reasoning underlies the M-ECPR formula:

"access" price = incumbent's incremental cost of "access" per unit
*plus* the incumbent's opportunity cost of providing the unbundled input.

In the context of unbundled network elements, the incremental cost of "access" is simply the TELRIC referenced in the FCC's *First Report and Order,* appropriately calculated. Recall, TELRIC represents the forward-looking cost (capital and operating) attributable to a particular network element, for example, a loop.

In the absence of market alternatives which offer end users prices below the incumbent carrier's retail rates, the opportunity cost of providing the unbundled input equals forgone revenues (based on the incumbent LEC's tariffed retail rate) less incremental costs. When market alternatives are present, the prices of those alternatives determine the opportunity costs of unbundled network services.[25] The economically correct measure of the incumbent LEC's opportunity costs of selling the unbundled network service (such as a port or a loop) is the difference between the market price of the service (inclusive of purchase, installation, and operating costs) and the LEC's incremental costs. With facilities-based competition for loops and ports, the M-ECPR then says that the price of the service should be the sum of the LEC's incremental costs and the opportunity cost, which exactly equals the market price.

Thus, properly calculated, the M-ECPR pricing takes into account market limits on the contribution of revenues to forward-looking joint and common costs. In other words, M-ECPR uses market benchmarks to determine the amount of forward-looking common costs that can be "reasonably" allocated to an individual network element.

In order to appreciate why the M-ECPR satisfies all the requirements that Congress and the FCC have established for setting prices for resale services and unbundled network elements, we present several examples. Consider an incumbent LEC that employs an input (generically called "access") to provide a retail service. The retail service has a regulated price of $10.00 per unit. The incumbent LEC incurs two costs in providing this service: "access," which has an incremental cost of $3.00 per unit and "transport," which has an

[25] In this report, references to "market alternatives" include both actual and potential alternatives.

incremental cost of $2.00 per unit. Thus, the regulated price provides contribution to joint and common costs equal to $5.00 per unit (i.e., $10.00 - $3.00 - $2.00).

In the absence of market alternatives, the M-ECPR loop price (incremental plus opportunity costs) is simply:

M-ECPR = $8.00 (i.e., $3.00 + $5.00).

Now suppose, an entrant can self-supply loop service for $7.00. In this case, the incumbent LEC's opportunity costs of selling the services of a loop to a competitor is $7.00 minus $3.00, which equals $4.00. In this example, the M-ECPR loop price (incremental plus opportunity costs) is simply:

M-ECPR = $3.00 + ($7.00 - $3.00) = $7.00.

In other words, whenever there are market alternatives, the M-ECPR price will be determined by the lowest-priced alternative. Alternatively, suppose the entrant buys a loop for $8.00 but then reduces the retail price to $9.00. This reduces the opportunity cost of the loop to $4.00 and the M-ECPR price falls to $7.00.

A desirable feature of the pricing rule is that it satisfies the requirement that the incumbent is displaced if and only if the entrant is more efficient (has a lower cost) than the incumbent. The efficiency property of M-ECPR can be easily demonstrated. Assume, in the above example, that a unit of access not sold to the competitor could generate contribution of $5.00. Thus, the relevant opportunity cost is $5.00 and the M-ECPR price is $8.00. If the incumbent LEC charges $8.00 per unit of access, two things will be true: (1) the incumbent LEC will cover its direct cost of providing access and (2) entry will occur only if the rival has a lower "transport" cost. To see how M-ECPR promotes efficient entry, assume first that the entrant has the same transport cost as the incumbent LEC, i.e., $2.00 per unit. Combining this cost with the M-ECPR access price of $8.00, the entrant can maintain a retail price of $10.00, which is just the initial regulated rate. Therefore if the entrant has the *same* transport cost as the incumbent LEC, the M-ECPR price allows it to earn zero economic profit.

Suppose now that the entrant has a *lower* transport cost than the incumbent LEC – say, $1.00 per unit, as compared with $2.00 for the incumbent LEC. In this case the entrant can purchase access at the M-ECPR price and set a retail price of only $9.00 per unit. Thus, the more efficient firm can profitably enter and take customers away from the incumbent LEC. Finally, if the entrant's transport cost were

*greater* than that of the incumbent LEC – say $3.00 per unit – then it could not profitably enter, which would be the efficient outcome from society's standpoint.

## G. CONCLUSIONS

In this chapter, we have presented the market-determined efficient component pricing rule and shown that it satisfies the FCC's recommendation that prices for wholesale services and unbundled network elements be based on forward-looking costs. When combined with a system of competitively neutral end-user charges, the rule also satisfies the requirement of Congress that prices be based on costs and allow for a reasonable profit. We stressed that the M-ECPR is *not* the same as the FCC's version of that rule, which we termed FCC-ECPR. The two pricing rules result in substantially different prices. We present an estimate of GTE's forward-looking common costs and find these costs are substantial. Thus the FCC's pricing rule (i.e., TELRIC plus a reasonable allocation of forward-looking common costs) results in prices for unbundled network elements in excess of TELRIC.

# IV

# Application of the Market-Determined Efficient Component-Pricing Rule for the Establishment of Wholesale Prices

In this chapter we show how to apply the M-ECPR to determine wholesale prices for the resale services offered by incumbent LECs. In the application of the M-ECPR to the establishment of wholesale prices, the M-ECPR price equals:

*Wholesale Price = Retail Price - Avoided Cost of Resale*

This method follows precisely section 252(d)(3) of the *Act*, which states that "a State Commission shall determine wholesale rates on the basis of retail rates charged to subscribers for the telecommunications service requested, excluding the portion thereof attributable to any marketing, billing, collection, and other costs that will be avoided by the local exchange carrier."[1] Since the method begins with the retail price and subtracts the avoided costs, it is referred to as the "top down" method.

## A. THE TOP DOWN APPROACH TO CALCULATING M-ECPR WHOLESALE PRICES

As specified by the *Act*, the wholesale price is simply the retail price minus avoided cost. An example of the application of this method is as follows.[2] Suppose that an alternative local exchange carrier wanted to

1. 47 U.S.C. § 252(d)(3).

2. The chapter presents illustrative wholesale rates for two GTE rate groups. For presentation purposes, a high and low rate group were chosen, with the high rate group shown in the text and the low rate group shown in the Appendix to this chapter.

purchase GTE's single line measured business service and not provide vertical and toll services. Suppose further that the retail rate for basic service equaled $29.90 per line. GTE has calculated that the avoided cost of providing the service at resale equals $3.72 per line. In this case, the wholesale rate equals $26.18 per line, i.e., $29.90 per line less $3.72 per line.

Suppose, however, that the alternative local exchange carrier proposed to provide local toll service and wants to purchase basic service at wholesale from GTE. In this case, the alternative local exchange carrier can self-provide local toll service packaged with GTE's resold local services. When this occurs, GTE loses an important source of contribution for recovery of the forward-looking common costs of its network. Moreover, the likelihood of this loss of contribution occurring is a near certainty, given that the vast majority of GTE's local residential and business customers also purchase local toll service from GTE. That is, as a practical matter, local and local toll services are purchased as a bundle by nearly all of GTE's residential and business customers. Thus, when alternative LECs purchase GTE's basic local service, they likely will bundle that service with their own self-provided local toll service, thereby capturing a key source of contribution that works to keep basic exchange prices low.[3] For all practical purposes, when GTE loses a basic business customer to a alternative LECs, it also loses the toll contribution made by that customer. Therefore, the relevant retail price to use in calculating the wholesale price is the bundled rate for toll and local service.

Using actual retail rate, cost, and revenue data for GTE, a numerical example of how to calculate the M-ECPR wholesale price for a local service that will be bundled with toll service provided by an alternative LEC is presented in Table IV-1. The table presents a numerical example of this approach based on GTE's basic business service, which has a monthly retail rate of $29.90 per line. GTE has determined that the TSLRIC of this service is $20.71 per line. To calculate the M-ECPR wholesale price, it is first necessary to subtract GTE's avoided cost of retailing from the per line retail rate. In Table IV-1, the avoided cost of retailing is given as $3.72 per line. Second, GTE's foregone toll contribution is added to account for the opportunity cost from the entrant's bundling GTE's basic business service with self-provided local toll service. From Table IV-1, this foregone contribution equals $2.87 for the average basic business customer. Because GTE receives revenues for the provision of originating and terminating switched access services when alternative local exchange carriers provide intraLATA toll services, the

3. Alternative LECs have the incentive to self-supply local toll given the relatively high contribution embodied in GTE's rate for such service.

contribution from these access revenues of $2.11 is subtracted. The resulting basic business wholesale rate is $26.94 per line.

The above numerical example assumes that alternative local exchange carriers do in fact self-provide toll services to customers who select their basic business resale service. There are two exceptions to the proposed pricing rule when this does not occur. First, if the alternative LEC provided local toll service to a customer prior to the time when unbundling was initiated, then GTE has no opportunity cost when that carrier continues to provide local toll service to those customers. Therefore, upon such a showing, GTE will remove the opportunity cost shown in Table IV-1 (i.e., $2.87 - $2.11 = $0.76). Second, if the alternative LEC can make a showing that it has not self-supplied local toll service to GTE's customers, GTE again would remove the opportunity cost of toll from the wholesale basic business rate.

The above calculation of the basic business wholesale price does not include the contribution GTE earns from the provision of vertical services. That is, the analysis assumes that when an alternative LEC purchases basic business service at resale, it must rely on GTE to supply vertical features. Since the alternative LEC cannot self-supply vertical features in this case, GTE does not lose contribution from those services. Therefore, the opportunity cost of vertical features is not part of the basic business wholesale rate.

With respect to residential service, the retail rate, cost, and revenue data for GTE used calculate the M-ECPR wholesale price for a local service that will be bundled with toll service provided by an alternative LEC is presented in Table IV-2. GTE's basic residential service has a monthly retail rate of $11.81 per line. GTE has determined that the TSLRIC of this service is $23.45 per line. Therefore, basic residential subscribers receive a subsidy of $11.64 per line. From this retail rate, we subtract GTE's avoided cost of retailing, which equals $1.22 per line, and add GTE's foregone toll contribution, which equals $1.83 for the average subscriber receiving basic residential service. After netting out GTE's intraLATA access contribution of $1.34, the resulting wholesale rate for basic residential service equals $11.08 per line.

TABLE IV-1
NUMERICAL EXAMPLE: "TOP DOWN" APPROACH
CALCULATION OF THE WHOLESALE RATE FOR
BASIC BUSINESS SERVICE
HIGH RATE GROUP
(DOLLARS PER LINE PER MONTH)

| | |
|---|---|
| Retail Rate | $29.90 |
| *less* | |
| Avoided Cost[1] | 3.72 |
| *plus* | |
| Foregone Toll Contribution[2] | 2.87 |
| *less* | |
| IntraLATA Access Contribution[3] | 2.11 |
| *equals* | |
| Wholesale Rate | $26.94 |

Notes:
1/ Avoided cost equals avoided retailing cost less incremental wholesaling cost.
2/ Foregone toll contribution equals average toll revenue less incremental cost of toll.
3/ IntraLATA access contribution equals intraLATA access revenue less incremental cost of access.

BASIC BUSINESS SERVICE DATA

| | |
|---|---|
| Average Toll Revenue | $3.32 |
| Incremental Cost of Toll | $0.45 |
| IntraLATA Access Revenue | $2.20 |
| Incremental Cost of Access | $0.09 |

TABLE IV-2
NUMERICAL EXAMPLE: "TOP DOWN" APPROACH
CALCULATION OF THE WHOLESALE RATE FOR
BASIC RESIDENTIAL SERVICE
HIGH RATE GROUP
(DOLLARS PER LINE PER MONTH)

| | |
|---|---|
| Retail Rate | $11.81 |
| *less* | |
| Avoided Cost[1] | 1.22 |
| *plus* | |
| Foregone Toll Contribution[2] | 1.83 |
| *less* | |
| IntraLATA Access Contribution[3] | 1.34 |
| *equals* | |
| Wholesale Rate | $11.08 |

Notes:
1/ Avoided cost equals avoided retailing cost less incremental wholesaling cost.
2/ Foregone toll contribution equals average toll revenue less incremental cost of toll.
3/ IntraLATA access contribution equals intraLATA access revenue less incremental cost of access.

BASIC RESIDENTIAL SERVICE DATA

| | |
|---|---|
| Average Toll Revenue | $2.01 |
| Incremental Cost of Toll | $0.18 |
| IntraLATA Access Revenue | $1.43 |
| Incremental Cost of Access | $0.09 |

Notice that the retail rate for basic residential service is $11.81, while the wholesale rate is $11.08. However, recognizing the bundled nature of those two services in the marketplace, the appropriate rate to use in a comparison with the wholesale rate for basic residential service is not GTE's basic residential retail rate, but rather the combined rate for basic residential service and local toll. GTE's residential customers pay, on average, $2.01 per month for local toll service. When this amount is added to GTE's rate for basic residential service, the resulting combined price of local exchange and local toll service is $13.82, which exceeds the calculated wholesale price for basic residential service by $2.74. This means that an alternative LEC can profitably enter and supply both local exchange and local toll services if that carrier's retail marketing and incremental toll costs are less than GTE's avoided retailing costs and incremental toll costs. That is, as noted above, the M-ECPR wholesale price satisfies the requirement that the incumbent LEC is displaced if and only if the entrant has a lower incremental retailing and toll cost than does the incumbent.

Finally, both the existing retail rate and the M-ECPR wholesale rate are less than the TSLRIC of the service. GTE currently can provide such subsidized service because the losses are made up by contributions collected from such services as vertical features and exchange access service. If no facilities-based bypass were to occur, this system of cross subsidies could be maintained if M-ECPR wholesale rates were established. However, if facilities-based bypass were to occur (in fact, such bypass already has occurred), the current below-cost rates could not be maintained. Facilities-based entrants, not surprisingly, target high-margin customers, such as high-volume business customers. By capturing some of the sources of subsidy funds, facilities-based entrants undermine the current rate structure. Thus, the current rate structure is not sustainable and should be rebalanced to remove these cross subsidies. A final problem caused by below-cost service is that it provides a disincentive to facilities-based entrants to offer service to relatively high-cost customers, such as residential and rural subscribers.

### B. THE BOTTOM UP APPROACH TO CALCULATING M-ECPR WHOLESALE PRICES

The M-ECPR methodology also can be used to calculate wholesale rates based on the service's TSLRIC. This is referred to as the "bottom up" approach, and it yields precisely the same wholesale rates as calculated by the "top down" approach. The bottom up approach is applied here to the calculation of wholesale rates for basic business service because it motivates the discussion in Chapter V where that

approach is applied to calculate prices for unbundled network elements. (The top down approach is inapplicable to the determination of prices for unbundled network elements.)

The "bottom up" calculation begins with the incremental cost of providing the service at resale, and adds to that amount all pertinent opportunity costs. As shown in Table IV-3, the incremental cost of the resale basic business service equals the total service incremental costs for basic business less GTE's avoided retailing cost, or $16.99 per line. GTE's opportunity cost equals the contribution embodied in its basic business service, $9.19, plus the foregone contribution from local toll, $0.76, or $9.95 per line. Thus, the bottom up wholesale price equals $26.94 per line (i.e., $16.99 + $9.95), which as discussed is identical to the top down wholesale price for basic business service shown in Table IV-1.

Table IV-4 applies the "bottom up" approach to the calculation of the basic residential rate. As shown in Table IV-4, the incremental cost of that service equals the total service incremental costs less GTE's avoided retailing cost, or $22.23 per line. GTE's opportunity cost equals the contribution embodied in its basic residential service, negative $11.64, plus the foregone contribution from local toll, $0.49, or negative $11.15 per line. Thus, the bottom up wholesale price equals $11.08 per line (i.e., $22.23 + negative $11.15), which is identical to the top down wholesale price for basic residential service shown in Table IV-2.

### C. CONCLUSIONS

The M-ECPR pricing rule yields wholesale prices for services sold at resale by the incumbent LEC that meet the pricing requirements stated in the *Act*. The M-ECPR method can be applied either as a "top down" approach, starting with the applicable retail rates, or as a "bottom up" approach, starting with the applicable TSLRICs. Both procedures yield the same wholesale prices. An important aspect of the application of the methodology is the recognition that customers essentially always purchase local and local toll services together from the same carrier, so the applicable retail rate from which to net out avoided retail costs is the bundled price for local and local toll service.

TABLE IV-3
NUMERICAL EXAMPLE: "BOTTOM UP" APPROACH
CALCULATION OF THE WHOLESALE RATE FOR
SINGLE-LINE MEASURED BUSINESS SERVICE
HIGH RATE GROUP
(DOLLARS PER LINE PER MONTH)

| | |
|---|---|
| Network TSLRIC[1/] | $16.99 |
| *plus* | |
| Opportunity Cost[2/] | 9.95 |
| *equals* | |
| Total | $26.94 |

Notes:
[1/] TSLRIC is Total Service Long Run Incremental Cost. Network TSLRIC equals TSLRIC less avoided cost.
[2/] Opportunity cost equals contribution per line plus net contribution from intraLATA toll service.

BASIC BUSINESS SERVICE DATA

| | |
|---|---|
| TSLRIC | $20.71 |
| Avoided Cost | $3.72 |
| Contribution Per Line | $9.19 |
| Net Contribution from IntraLATA Toll Service | $0.76 |

TABLE IV-4
NUMERICAL EXAMPLE: "BOTTOM UP" APPROACH
CALCULATION OF THE WHOLESALE RATE FOR
BASIC RESIDENTIAL SERVICE
HIGH RATE GROUP
(DOLLARS PER LINE PER MONTH)

| | |
|---|---|
| Network TSLRIC[1/] | $22.23 |
| *plus* | |
| Opportunity Cost[2/] | (11.15) |
| *equals* | |
| Total | $11.08 |

Notes:
[1/] TSLRIC is Total Service Long Run Incremental Cost. Network TSLRIC equals TSLRIC less avoided cost.
[2/] Opportunity cost equals contribution per line plus net contribution from intraLATA toll service.

BASIC RESIDENTIAL SERVICE DATA

| | |
|---|---|
| TSLRIC | $23.45 |
| Avoided Cost | $1.22 |
| Contribution Per Line | ($11.64) |
| Net Contribution from IntraLATA Toll Service | $0.49 |

# V

# Application of the Market-Determined Efficient Component-Pricing Rule for the Establishment of Unbundled Network Element Prices

In this chapter we show how to apply the M-ECPR methodology to determine prices for unbundled network elements in accordance with the *Act*. Recall that Section 252(d)(1) of the *Act* states that unbundled network element charges "(A) shall be (i) based on the cost (determined without reference to a rate-based proceeding) of providing the interconnection or network element (whichever is applicable), and (ii) nondiscriminatory, and (B) may include a reasonable profit."[1] Also recall that the *First Report and Order* concludes "that, under a [Total Element Long Run Incremental Cost] methodology, incumbent LECs' prices for interconnection and unbundled network elements shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[2]

As shown in Chapter III, the FCC's recommended pricing rule for unbundled network elements is represented by the following formula:

1. 47 U.S.C. § 252(d)(1).
2. *First Report and Order*, at ¶ 682.

*Price of Unbundled Element = TELRIC + (x) (FLCC)*

where:

| | |
|---|---|
| *TELRIC* | = Total Element Long Run Incremental Cost; |
| *FLCC* | = Forward Looking Common Costs; and |
| *x* | = Reasonable share of FLCC allocated to the unbundled network element. |

In this chapter we discuss how the M-ECPR determines the reasonable allocation of forward-looking common costs (i.e., *x* in the above equation) in accordance with the *First Report and Order*. The chapter is organized as follows. Section A discusses the services that alternative local exchange carriers can provide by using unbundled network elements. Section B analyzes how an incumbent carrier's forward-looking common costs should be allocated according to the *First Report and Order*. Section C shows how to calculate M-ECPR rates and contrasts the resulting rates with those calculated according to the FCC-ECPR methodology. Section D discusses the fact that an incumbent carrier may be unable to recover its forward-looking common costs under the M-ECPR methodology. Section E analyzes how the requirement of the *First Report and Order* that specifies prices for unbundled network elements "shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs"[3] can be met with a system of competitively neutral end-user charges.

## A. SERVICES ALTERNATIVE LOCAL EXCHANGE CARRIERS CAN PROVIDE BY USING UNBUNDLED NETWORK ELEMENTS

Unbundling allows alternative LECs to enter the local exchange market and provide basic, vertical, and local toll services in a variety of ways. Consider a carrier's options with respect to loop and port/switch facilities. A carrier could construct its own loop facilities and lease port/switch services from GTE in order to provide switched services. Alternatively, a carrier could lease GTE's loop facilities and obtain its own port/switch facilities to provide these services. A carrier could also obtain loop and port/switch facilities from GTE by purchasing at wholesale GTE's basic retail services. Of course, an entrant also could construct its own network of loops and port/switch facilities completely bypassing the incumbent's facilities. These options are summarized in Figure V-1.

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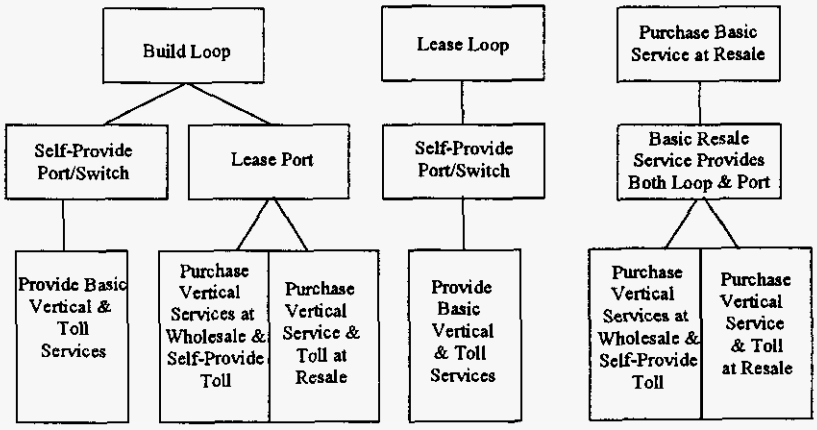
3. *First Report and Order*, at ¶ 682.

FIGURE V-1
OPTIONS AVAILABLE TO ALTERNATIVE
LOCAL EXCHANGE CARRIERS




When entrants lease unbundled loops and self-provide port/switch facilities, they can provide basic local service, vertical features, and local toll service, as well as switched access and interLATA toll service, without purchasing any of GTE's retail services at wholesale. This is distinguished from the resale example discussed in Chapter IV in which alternative LECs could not provide vertical features without purchasing them at wholesale from GTE. With unbundling, therefore, alternative LECs can capture the contributions that flow from GTE's provision of vertical services as well as local toll, and this tends to increase the incumbent carrier's forgone revenues from unbundling its network elements.

### B. THE DETERMINATION OF A REASONABLE ALLOCATION OF FORWARD-LOOKING COMMON COSTS ACCORDING TO THE *FIRST REPORT AND ORDER*

Following the recommendation in the *First Report and Order* that prices not exceed stand-alone costs, our understanding is that alternative local exchange carriers with demands for port/switching services generally, and local switches and tandem switches in particular, have available market alternatives at competitive prices. Assuming that port/switching services, signaling, and transport can be purchased at competitive prices from third-party vendors, it follows that alternative LECs would have a strong incentive to self-provide these network elements if GTE's prices for unbundled elements exceeded the purchase, installation, and operating cost of self-supplied facilities.

As a consequence of this competitive market constraint, the *First Report and Order's* reasonable allocation can apply relatively little, if any, of the incumbent carrier's forward-looking common costs to the prices of unbundled services other than the loop. In contrast, there are relatively fewer market constraints on the provision of loops, so that the *First Report and Order's* reasonable allocation can apply relatively more of the incumbent carrier's forward-looking common costs to the prices of unbundled loops.

### C. APPLICATION OF THE BOTTOM UP M-ECPR METHOD TO CALCULATE PRICES FOR UNBUNDLED NETWORK ELEMENTS

The determination of unbundled network element prices can be accomplished by applying the "bottom up" M-ECPR method. With the "bottom up" method, the price of an unbundled network element equals the sum of the relevant TELRIC plus a reasonable allocation of the firm's forward-looking common costs, where that allocation depends on market alternatives.

As discussed in Chapter III, the M-ECPR rates depend on the presence or absence of these market alternatives. If all market alternatives are assumed away, then FCC-ECPR rates are obtained. But if market alternative are considered, then M-ECPR rates are obtained. In the next two subsections, we calculate the rates for unbundled loops provided to business or residential customers. First we assume away all market alternatives to the incumbent LEC's services, and then we explicitly consider these alternatives to calculate the M-ECPR rates.

### 1. CALCULATION OF PRICES FOR UNBUNDLED LOOPS ASSUMING THE ABSENCE OF MARKET ALTERNATIVES

Table V-1 provides a numerical example for calculating the loop price based on service provided to an average business customer, assuming the absence of market alternatives. The table identifies the sources of contribution from an average business customer. Total revenues from such a customer equal $69.21 per line, and the total TSLRIC for providing those services equals $27.91 per line. Thus, total contribution in this example equals $41.30 per line. The loop price assuming the absence of market alternatives equals (1) the TELRIC of the loop facility, $23.26, inclusive of the incremental marketing cost of providing unbundled loops; plus (2) the foregone contribution or opportunity cost of providing the unbundled loop, $41.30, resulting in an unbundled loop price of $64.56 per line.

With respect to residential customers, Table V-2 presents the calculations of the unbundled loop price for an average residential customer, assuming the absence of market alternatives for the incumbent LEC's services. An average residential customer provides a monthly contribution of $6.21 per line, which when added to the TELRIC of the loop, $23.26, yields an unbundled loop price of $29.47.

In these examples, we assume that alternative local exchange carriers bypass GTE's port/switching facilities so that it obtains no contribution from the provision of those unbundled network elements. If, to the contrary, unbundled prices for port/switching services included some contribution (in other words, if market alternatives were less binding), that contribution would be subtracted from total forward-looking common costs before determining the unbundled price of the loop. That subtraction would ensure the contribution provided by unbundled loops and port/switches did not exceed the contribution embodied in the prices of GTE's retail services.

TABLE V-1
NUMERICAL EXAMPLE: UNBUNDLED LOOP RATE
CALCULATION BASED ON AVERAGE BUSINESS CUSTOMER
(DOLLARS PER LINE PER MONTH)

| | Revenue | TSLRIC[/1] | Contribution |
|---|---|---|---|
| Basic Retail Service | $37.49 | $24.60 | $12.89 |
| End-User Line Charge | 5.84 | 0.00 | 5.84 |
| Local Toll | 3.32 | 0.45 | 2.87 |
| Vertical Services | 1.33 | 0.63 | 0.70 |
| Switched Access | | | |
| Interstate | | | |
| CCLC[/2] | 6.69 | 0.00 | 6.69 |
| Other | 6.49 | 1.70 | 4.79 |
| Intrastate | 8.05 | 0.53 | 7.52 |
| Total | $69.21 | $27.91 | $41.30 |

Notes:
[/1] Total Service Long-Run Incremental Cost
[/2] Common Carrier Line Charge

LOOP PRICE ASSUMING THE ABSENCE OF MARKET ALTERNATIVES

| | |
|---|---|
| Unbundled Loop TELRIC | $23.26 |
| (inclusive of incremental marketing costs) | |
| *plus* | |
| Opportunity Costs (foregone contribution) | 41.30 |
| *Total* | $64.56 |

TABLE V-2
NUMERICAL EXAMPLE: UNBUNDLED LOOP RATE
CALCULATION BASED ON AVERAGE RESIDENTIAL CUSTOMER
(DOLLARS PER LINE PER MONTH)

| | Revenue | TSLRIC[/1] | Contribution |
|---|---|---|---|
| Basic Retail Service | $12.42 | $24.36 | ($11.94) |
| End-User Line Charge | 3.50 | 0.00 | 3.50 |
| Local Toll | 2.01 | 0.18 | 1.83 |
| Vertical Services | 2.50 | 0.05 | 2.45 |
| Switched Access | | | |
| Interstate | | | |
| CCLC[/2] | 3.13 | 0.00 | 3.13 |
| Other | 3.04 | 0.79 | 2.25 |
| Intrastate | 5.33 | 0.34 | 4.99 |
| Total | $31.93 | $25.72 | $6.21 |

Notes:
/1 Total Service Long-Run Incremental Cost
/2 Common Carrier Line Charge

LOOP PRICE ASSUMING THE ABSENCE OF MARKET ALTERNATIVES

| | |
|---|---|
| Unbundled Loop TELRIC | $23.26 |
| (inclusive of incremental marketing costs) | |
| *plus* | |
| Opportunity Costs (foregone contribution) | 6.21 |
| *Total* | $29.47 |

## 2. CALCULATION OF M-ECPR RATES

Suppose the entrant's stand-alone cost of supplying its own loop facilities were less than the unbundled loop prices for average business or residential customers, which were calculated on the assumption that no market alternatives existed for the incumbent LEC's services. Should GTE have the flexibility to lower the price of its loop facilities? The answer is yes, because otherwise the unbundled loop price would violate the recommendation in the *First Report and Order* that prices of unbundled network elements should not exceed their stand-alone costs. Given the presence of market alternatives, GTE's M-ECPR price equals its TELRIC for loop service plus the opportunity cost *as constrained by market forces*.

This can be illustrated using a simple example. Assume a facilities-based competitor can self-supply loop facilities to business customers for $40.00 per line. GTE's forgone revenues would equal $40.00 minus its TELRIC of loop service (including marketing costs), which in our example equals $23.26. Thus, the resulting M-ECPR loop price equals $23.26 plus $16.74 (i.e., $40.00 - $23.26), or simply the entrant's stand-alone cost of $40.00.

In addition to building their own loops, alternative LECs have other available substitutes to GTE's unbundled loop facilities. An entrant carrier can acquire basic business service at wholesale, which includes the services of both a loop and port/switching services; alternatively, that carrier could purchase 2-wire private line service from GTE. If either of these two alternatives had a lower price than the loop price calculated on the assumption that no such market alternatives existed, then the entrant carrier would choose to purchase the lowest priced alternative.

If private line service is a good substitute for GTE's unbundled loops, the presence of the private line rate constrains GTE's ability to establish loop prices that maintain contribution. For example, if GTE's 2-wire private line rate were $33.08, GTE would not receive the unconstrained price for its loop facilities because of the presence of its substitute 2-wire private line service.

In sum, given the presence of a 2-wire private line service at $33.08, a comparison of the FCC-ECPR and M-ECPR rates for an unbundled loop provided to an average business customer shows the following:

- FCC-ECPR unbundled loop price equals $64.56; and
- M-ECPR unbundled loop price equals $33.08.

This illustrates the potentially large differences between FCC-ECPR rates and M-ECPR rates. These differences in rates are caused by the fact the FCC-ECPR methodology explicitly assumes away all competitive market alternatives, whereas the M-ECPR explicitly takes those alternatives into account.

### D. THE PRESENCE OF MARKET ALTERNATIVES CAN PREVENT AN INCUMBENT CARRIER FROM RECOVERING ITS FORWARD-LOOKING COMMON COSTS

When customers are able to self-supply loop facilities, or to purchase substitute services from GTE at a rate less than the loop price calculated on the assumption that no market alternatives exist, the market-determined M-ECPR prices for loop and port/switching facilities will not enable GTE to recover its forward-looking common costs. In addition, the presence of market alternatives can prevent an incumbent LEC from recovering its historical costs. These M-ECPR prices do enable a carrier to cover the direct economic cost of providing the unbundled services, that is the direct incremental cost of providing the service (TELRIC) plus opportunity costs. However, M-ECPR rates constrained by market alternatives do not enable GTE to recover its forward-looking common costs and, therefore, do not cover its total costs. Table V-3 illustrates the deficit for business customers resulting from establishing a loop price equal to $33.08 as mandated by the presence of market alternatives.[4] In the case of residential customers, the loop price assuming the absence of market alternatives is less than the M-ECPR rate. But entrants likely will target relatively high-margin business customers. As a result, GTE's realized deficit likely will be determined by the difference between (1) the weighted-average loop price assuming the absence of market alternatives (where the weights are the number of business and residential lines) and (2) the M-ECPR loop price, as shown in Table V-3

4 If GTE's 2-wire private line rate were below its TELRIC, the deficit would be larger. Such below-cost rates would provide a subsidy to entrants. Of course, such subsides should be eliminated by raising the 2-wire private line rate to cover its long run incremental costs.

TABLE V-3
DEFICIT RESULTING FROM M-ECPR LOOP PRICE
CONSTRAINED BY 2-WIRE PRIVATE LINE ALTERNATIVE
(AVERAGE BUSINESS CUSTOMER)

| | |
|---|---|
| Loop Price Assuming the Absence of Market Alternatives | $64.56 |
| Loop Price based on M-ECPR using Market Alternatives | 33.08 |
| Deficit | $31.48 |

DEFICIT RESULTING FROM M-ECPR LOOP PRICE
CONSTRAINED BY 2-WIRE PRIVATE LINE ALTERNATIVE
(AVERAGE RESIDENTIAL CUSTOMER)

| | |
|---|---|
| Loop Price Assuming the Absence of Market Alternatives | $29.47 |
| Loop Price based on M-ECPR using Market Alternatives | 33.08 |
| Deficit | ($3.61) |

DEFICIT RESULTING FROM M-ECPR LOOP PRICE
CONSTRAINED BY 2-WIRE PRIVATE LINE ALTERNATIVE
(WEIGHTED-AVERAGE CUSTOMER)

| | |
|---|---|
| Loop Price Assuming the Absence of Market Alternatives | $38.49 |
| Loop Price based on M-ECPR using Market Alternatives | 33.08 |
| Deficit | $5.41 |

To summarize, the *First Report and Order* specifies that prices for unbundled network elements "shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[5] But market alternatives may prevent an incumbent carrier from recovering these costs. Thus the question arises as to how the FCC's mandate can be met so that an incumbent carrier can recover its forward-looking common costs.

### E. THE ROLE OF COMPETITIVELY NEUTRAL END-USER CHARGES IN RECOVERING A CARRIER'S FORWARD-LOOKING COMMON COSTS

How should prices for unbundled network elements be established to ensure that GTE's rates recover its forward-looking common costs? As a general statement, the M-ECPR does not alter in any material way the traditional problems faced by a regulated carrier operating with a rate structure that contains cross subsidies mandated by regulation. For the firm's rate structure to be preserved and to allow recovery of its total costs, accompanying end-user charges are required. As the example above clearly demonstrates, while the M-ECPR enables the incumbent LEC to recover its incremental costs and opportunity costs, it does not allow cost recovery as would the regulated rates absent entry. Thus, the incumbent LEC also may be prevented from recovering its historical costs. Generally, facilities-based entry and M-ECPR pricing of unbundled network elements result in stranded costs.[6] The reason is that the M-ECPR price is reduced by competition.

The fall in the M-ECPR price provides useful guidance on how to set end-user charges to achieve recovery of stranded costs. The end-user charge should equal the difference between net revenues obtained using the FCC-ECPR (i.e., the price based on the regulated rate structure) and the net revenues obtained from the lower, market constrained M-ECPR price that takes into account entrants' alternatives.

What costs do the end-user charge recover? The end-user charge recovers portions of six types of cost burdens that the incumbent LEC cannot recover through competitive, unbundled prices but nonetheless has incurred to discharge its obligation to serve:

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5. *First Report and Order*, at ¶ 682.

6. Stranded costs are defined as (1) the present value of net revenues for the incumbent under regulation minus (2) the present value of net revenues under competition.

(1) shared costs of network operation, incurred among two or more (but not all) of the incumbent LEC's services, but not wholly attributable to any single service;

(2) common costs of network operation, incurred among all of the incumbent LEC's services;

(3) losses incurred in providing services to customers at regulated prices that are below the incremental cost of providing such service; and

(4) costs incurred as a result of incumbent burdens that the incumbent LEC continues to bear after the advent of competition, but which entrants are not required to bear, such as universal service obligations.

(5) costs incurred by GTE to accomplish government-mandated unbundling of network elements or resale of network services; and

(6) losses incurred when GTE's avoided costs are incorrectly overstated and are used to establish the discount that competitors receive when purchasing wholesale services from GTE.

If such a system of end-user charges were not put in place, the incumbent LEC would earn negative economic profits and therefore would be denied the opportunity to earn the "reasonable profit" envisioned by Section 252(d)(3) of the Telecommunications Act of 1996. In this circumstance, the implementation for prices of unbundled service elements would be in direct violation of the Act.

# VI

# Economic Problems That M-ECPR Pricing Avoids

In its April 19, 1996 Notice of Proposed Rulemaking on interconnection pricing, the FCC expressed several criticisms of its version of the efficient component pricing rule.[1] In particular, the *Interconnection NPRM* argued that the FCC-ECPR would protect monopoly profits if they are being earned by the incumbent LEC and that the rule would not ensure lower prices for consumers. These criticisms were also expressed in the *First Order and Report* which stated the rule "does not provide any mechanism for driving prices towards competitive levels; it simply takes prices as given."[2] The *First Report and Order* continued by stating that the FCC-ECPR would result in input prices that would be higher or lower than that would be generated in a competitive market.. This chapter illustrates that these economic problems and others are avoided when input prices are established using M-ECPR.

## A. THE M-ECPR DOES NOT PRESERVE MONOPOLY RENT

The FCC has argued that the FCC-ECPR will protect monopoly profits if they are being earned by the incumbent LEC and that the rule

1. Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Notice of Proposed Rulemaking, CC Dkt. No. 96-98, (Apr. 19, 1996) [hereinafter *Interconnection NPRM*].

2. *First Report and Order* at ¶ 709

does not ensure lower prices and higher outputs in a competitive market:

> Under the [FCC-ECPR], competitive entry will not place at greater risk the incumbent's recovery of its overhead costs or any profits that it otherwise would forego due to the entry of the competitor. In other words, the incumbent's profitability would not be diminished by providing interconnection or unbundled elements or both . . . . The [FCC-ECPR] presupposes that the incumbent is the sole provider of a bottleneck service, and seeks to define efficient incentives for incremental entry based on that assumption. Under the [FCC-ECPR], competitive entry does not drive prices toward competitive levels, because it permits the incumbent carrier to recover its full opportunity costs, including any monopoly profits.[3]

For four reasons, these claims are erroneous and misdirected when applied to M-ECPR.

*The M-ECPR Supports both Efficient Entry and Falling Prices.* The access price derived from the M-ECPR permits price to fall and output to expand for the final product relative to the price and output that had obtained under regulation.[4] Moreover, that result holds under a variety of market structures: In contestable markets, under Cournot-Nash competition, and in markets characterized by product differentiation, the M-ECPR rewards entry by more efficient rivals and produces lower prices for the final product. Finally, the equilibrium access price implied by the M-ECPR for each of those market structures is lower than the access price that would obtain in the stylized benchmark case in which the incumbent LEC is permitted (contrary to actual experience in regulated markets) to receive the entire monopoly rent in the opportunity-cost component of the FCC-ECPR.

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3. *Interconnection NPRM*, at ¶ 147. Similarly, the Commission said in its NPRM on CMRS interconnection: "[B]ecause the [FCC-ECPR] would permit an incumbent carrier to recover its opportunity costs, including any monopoly profits in the sale of the final service, the use of this rule may prevent competitive entry from driving prices towards competitive levels." *CMRS NPRM*, at ¶ 53.

4. Daniel F. Spulber & J. Gregory Sidak, *Access Pricing and Deregulation,*, Northwestern University, Kellogg Graduate School of Management, Working Paper (February, 1996).

*The Unrealistic Counterfactual of Unregulated Monopoly Free of Mandated Cross Subsidies*. To assume that a regulated monopolist is routinely and consistently earning monopoly rents is counterfactual: The *raison d'etre* of public utility regulation is to prevent a firm thought to be a natural monopoly from setting the profit-maximizing price of an unconstrained monopolist. Contrary to the FCC's implicit assumption, state regulation in place before the enactment of the 1996 federal legislation should be presumed to have limited rather than facilitated the extraction of monopoly rents. Even if a state did permit an incumbent LEC to earn monopoly rents, the need to reform that state's regulation would not justify the FCC's rejection of the M-ECPR in favor of some other pricing method that will fail to yield efficient and compensatory pricing of mandatory network access.

Moreover, if monopoly rents do persist in the pricing of some final product sold by the regulated incumbent LEC, it is likely that regulators have authorized or mandated the extraction of those rents as part of an overall rate structure that is rife with cross subsidies from one customer group to another. It is certainly possible, in other words, that the prices for specific services sold by the regulated incumbent LEC contain rents that the firm is obliged to extract from one set of customers and then dissipate in the course of subsidizing other services that the regulator orders the LEC to sell below cost. In that case, the recovery of the contributions to margin on the services supposedly generating the monopoly rents represents nothing more than a preservation of state-mandated cross subsidies; those positive contributions to margin should not be interpreted by the FCC in isolation as a preservation of monopoly rents that, on balance, flow from the combined classes of all customers to the incumbent LEC's shareholders. In any event, it is surely preferable for the regulator to eliminate the system of cross subsidies altogether by rebalancing the rate structure, rather than to reject the M-ECPR and instead price network access selectively on the basis of incremental cost while continuing to require the incumbent LEC to price various other services below cost. Such a selective approach would violate sound economic analysis and deny the incumbent LEC the opportunity to recover its costs, which eventually would destroy the LEC's financial solvency.

*The M-ECPR with Facilities-Based Competition for Access*. If facilities-based competition is infeasible, then the basis for the opportunity-cost calculation in the M-ECPR is the incumbent LEC's regulated margins. But if access competition is feasible, then the

ECPR methodology requires pricing at the incremental cost of the best alternative technology for providing network access, even if that lower price of access fails to preserve the incumbent LEC's regulated margin. Thus, M-ECPR does not protect the incumbent LEC's regulated margins from the downward pressure of access competition. Market forces simply will not permit the incumbent LEC to charge a higher price than the incremental cost of the best alternative technology for provision of network access, even if the incumbent LEC may lawfully attempt in vain to do so.

The existence of access competition also establishes that the facilities of the incumbent LEC are not "essential," as that term has come to be known in antitrust law.[5] Entry barriers to facilities-based competition are not insurmountable, as evidenced by the substantial investment in transmission and switching facilities that has already occurred in the local exchange.[6] In addition, technological change has lowered the entrant's need to make irreversible, transaction-specific investment: Wireless technologies lower the specificity of entry costs in comparison with traditional wired technologies. Consequently, there is less reason with each passing day to presume that the wireline facilities of the incumbent LEC, if unregulated by the states, still could generate the monopoly rents that evidently motivated the FCC's opposition to the states' use of the ECPR.

*Misdirected Criticism of Policy Instruments*. A claim that M-ECPR perpetuates monopoly rents is an attempt to redress a perceived failure of public utility regulation by manipulating the wrong policy instrument. Even if state regulators were to permit an incumbent LEC to earn monopoly rents (net of all government-mandated cross subsidies), that fact would not undermine the economic efficiency *of the M-ECPR*. The rule's purpose is to reward efficient entry into the market for the end product by ensuring that the incumbent LEC sells network access to itself and to its rivals on the same, nondiscriminatory terms. The M-ECPR accomplishes that task regardless of the market structure and regardless of the presence or absence of economic rents.

The Judicial Committee of the Privy Council of the House of Lords recognized the efficacy of the rule, when, in *Telecom*

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5. United States *v.* Terminal R.R. Ass'n, 224 U.S. 383 (1912); MCI Comm. Corp. *v.* American Tel. & Tel. Co., 708 F.2d 1081 (7th Cir.), *cert. denied*, 464 U.S. 891 (1983).

6. Daniel F. Spulber, *Deregulating Telecommunications*, 12 YALE J. ON REG. 25 (1995).

*Corporation of New Zealand Ltd.* v. *Clear Communications Ltd.*, that court of last resort considered whether the efficient component pricing would violate section 36 of New Zealand's Commerce Act by allowing Telecom to recover monopoly rents in the opportunity-cost component of the access price that it proposed to charge to the entering local carrier, Clear, for interconnection to Telecom's access network.[7] Their Lordships emphasized that courts applying section 36 "are not acting as regulators" and that "section 36 is only one of the remedies provided by the Commerce Act for the purpose of combating overpricing due to monopolistic behavior."[8] Other sections of the Commerce Act, Lord Browne-Wilkinson observed, are available to perform that role:

> Part IV [of the Commerce Act] deals separately with control of prices. Under section 53 the Governor General, on the recommendation of the Minister, may declare that the prices for goods or services of any description supplied to or for the use of different persons are controlled. Under section 53(2)(a) a Minister cannot make such a recommendation unless he is satisfied the goods or services are supplied in a market "in which competition is limited or is likely to be lessened". Under section 70 the Commission may authorize a price to be charged for controlled services. Therefore section 36 is only part of an overall statutory machinery for dealing with trade practices which operate to the detriment of consumers. Another part of such machinery (Part IV) is specifically directed to the regulation of prices in markets which are not fully competitive.[9]

The Privy Council ruled that "the risk of monopoly rents has no bearing upon the question whether the application of the [efficient component-pricing rule] prevents competition in the contested area."[10] "If *both* Telecom and Clear are charging their customers the same amount in the area in which they are not competitors," their Lordships

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7. [1995] 1 N.Z.L.R. 385 (Judgment of the Lords of the Judicial Committee of the Privy Council, Oct. 19, 1994); *see also* William J. Baumol & J. Gregory Sidak, *The Pricing of Inputs Sold to Competitors: Rejoinder and Epilogue*, 12 YALE J. ON REG. 177 (1995) (discussing New Zealand interconnection litigation).

8. [1995] 1 N.Z.L.R. at 404.

9. *Id.*

10. *Id.* at 407.

reasoned, "this does not have any effect on their relative competitiveness in the area in which they compete."[11]

### B. THE M-ECPR DOES NOT LIMIT COMPETITIVE ENTRY

M-ECPR does not limit competitive entry in the case of interconnection of local networks to effect terminating access. Likewise, when entry occurs instead by means of resale or unbundled access to network elements, access prices that recover the incumbent LEC's long run incremental costs and its opportunity costs are no barrier to the entry of competitors that are at least as efficient as the incumbent in the provision of retail services. In all three cases prices that are computed according to the M-ECPR are both efficient and compensatory. By setting access prices that allow the incumbent LEC to recover its costs, retail rates will fail to reflect (1) the efficiencies of resellers and of aggregators of unbundled elements, (2) the increased demand at the lower prices, and (3) the lowering of the cost recovery per unit.[12]

Now consider how competition in the provision of network access affects the M-ECPR and the incentives that it creates for efficient entry. With facilities-based competition, it is evident that the M-ECPR does not impede entry. Setting the M-ECPR at the incremental cost of the best alternative technology allows the entry of other companies that are at least as efficient as that entrant serving as the benchmark.

Some have argued that M-ECPR pricing excludes entrants that have the *potential* in the long run of becoming more efficient providers of some end service than the incumbent LEC. Proponents of that view are implicitly advocating an entry subsidy. The fallacy in that position, however, is that no one, including the regulator, can distinguish *ex ante* between those entrants that have such potential and those that do not. Furthermore, the incumbent LEC's forced subsidization of entrants is an undertaking that fundamentally differs in character from mandating that the LEC interconnect the networks of competing carriers, that it offer its retail services to competitors at wholesale, and that it offer its network elements to competitors on an unbundled basis. By effecting that subsidy, the regulator would force

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11. *Id.* (emphasis in original).

12. For a technical economic analysis demonstrating these assertions, see Spulber & Sidak, *Access Pricing and Deregulation, supra* note 4.

the incumbent LEC to fund a kind of public good: the entry of a multitude of inefficient firms into the local exchange market in the hope that one would eventually discover a lower-cost production technology than the incumbent LEC's for delivering an end service to consumers.

The end may be laudable but the means are not, for two reasons. First, the M-ECPR already rewards such innovation and does so in a neutral manner that does not condition the benefits that the innovating firm may reap from its achievement of cost-reducing breakthroughs on whether the innovator is the incumbent LEC or a new entrant. Second, if the government considers the quest for lower-cost technologies to be an endeavor likely to benefit the citizenry as a whole, it should expressly pay for the production of that public good, just as it might choose to subsidize other R&D activities believed to have potential public benefit. For the regulator, however, to require the incumbent LEC to subsidize its rivals' quest for superior production technologies is not only to impose a perverse regulatory policy, but also to confiscate the property of the incumbent LEC's shareholders and transfer it to shareholders of this class of favored entrants.

### C. THE M-ECPR DOES NOT IMPEDE DYNAMIC EFFICIENCY

In the *Interconnection NPRM*, the FCC asserted: "In general, the [FCC-ECPR] framework precludes the opportunity to obtain the advantages of a dynamically competitive marketplace."[13] That adverse result supposedly obtains because, according to the FCC, the incumbent LEC makes the same profits whether it provides the entire service or sells network access to entrants. In the FCC's view, that condition of indifference gives the incumbent LEC no incentive to reduce costs by introducing new technology or to provide better services. That reasoning, however, finds no support in either theory or experience.

Like the argument that the M-ECPR preserves monopoly rent, the argument that the rule impedes dynamic efficiency depends on a counterfactual assumption: Regulators are either indifferent to the incumbent LEC's total factor productivity or ineffectual in creating incentives for productivity growth. Such an assumption ignores the prevalence of price caps, rate freezes, and other incentive regulation

13. *Interconnection NPRM*, at ¶ 147.

schemes that reward greater efficiency.[14] Nothing prevents regulators from building incentive mechanisms of that sort into their regulation of the pricing of mandatory network access under the M-ECPR.

Furthermore, the FCC's claim of lost dynamic efficiency under the ECPR is controverted by the actual experience in New Zealand, the first nation to embrace the rule in local telephony. By any measure, Telecom New Zealand's investment and productivity gains have been substantial, and the country's telecommunications network is one of the most advanced in the world. From the beginning of deregulation in 1987 through the end of 1994, Telecom New Zealand invested over NZ$4.1 billion in network modernization and service enhancement.[15] Now, more than 97 percent of access lines are connected to digital switches; by 1998, Telecom New Zealand's telephone network will be entirely digitally switched.[16] In addition to this investment in infrastructure, there has been an "introduction of a growing range of new services such as call diversion, audio conference and call waiting."[17] To be sure, it would be an overstatement to attribute all of New Zealand's gains in efficiency to its adoption of efficient component pricing. Nonetheless, that empirical evidence at a minimum shifts the burden of proof back onto the FCC to substantiate its sweeping assertion that the states' use of such a rule would entail a sacrifice in dynamic efficiency.

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14. *See generally* DAVID E.M. SAPPINGTON & DENNIS L. WEISMAN, DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY (MIT Press & AEI Press 1996).

15. NEW ZEALAND MINISTRY OF COMMERCE, TELECOMMUNICATIONS REFORM IN NEW ZEALAND: 1987 1994, TELECOMMUNICATIONS LEAFLET NO. 5, at 4 (Jan. 19, 1995).

16. *Id.*

17. *Id.*

### D. THE M-ECPR DOES NOT REQUIRE DIFFICULT MEASUREMENT OF FUTURE EARNINGS FOREGONE

*Any* method for computing prices for network access will entail some nontrivial amount of administrative costs. The relevant objective, is not to minimize the regulator's administrative costs, but rather to maximize the gains in economic welfare from the access pricing rule chosen, net of such administrative costs. If a particular access pricing rule stifles efficient entry or bankrupts efficient incumbents, it is hardly an endorsement for that rule that it requires few of the regulator's resources to administer.

Application of M-ECPR would not be any harder than the typical test-year calculations that are routinely conducted in rate proceedings, or the estimates of productivity growth that are made to compute the "*X* factor" in price-cap regulation.

### E. THE ECPR DOES NOT CREATE COST-OF-SERVICE REGULATION

The M-ECPR is a method of pricing access that a regulator uses to unbundle an incumbent LEC's network. The rule is intended to produce efficient access and entry decisions and to compensate the incumbent LEC for the incremental cost and the opportunity cost of being compelled to allow a competitor to use the LEC's network. If, because of competition, even the M-ECPR cannot produce an access price for the incumbent LEC's network that is compensatory, then the regulator must take an additional step to ensure that the LEC can achieve full recovery of the cost of providing mandatory network access to its competitors. The regulator can do so by imposing an end-user charge equivalent to the amount of the shortfall remaining after computation of the access price implied by the M-ECPR.

From this brief recapitulation, it should be clear that the M-ECPR does not recreate cost-of-service regulation. To the extent that regulated retail rates remain in force, the M-ECPR provides a means to translate those rates into access charges for wholesale services and unbundled network elements. The continuation of regulated retail rates is a regulatory decision that is independent of the regulator's application of the M-ECPR to calculate wholesale rates.

To be sure, the calculation of wholesale rates does depend on the incremental cost and the opportunity cost borne by the regulated incumbent LEC. In the absence of regulation, the incumbent LEC would determine its own access charges in a similar manner. The

regulation of wholesale rates necessarily creates the need for the incumbent LEC to present cost information to the regulator as part of the process of administering the M-ECPR or, for that matter, any other rule for access pricing. The relaxation of cost-of-service regulation, on the other hand, would allow the incumbent LEC to set its access charges without presenting cost information to its regulator.

With facilities-based entry, the M-ECPR bases rates on the cost of the best alternative technology for the provision of network access. That computation requires an estimation of the *competitor's* cost. Such an exercise differs substantially from regulation based on the costs of the firm being regulated namely, the incumbent LEC. Consequently, when firms compete to provide network access, the regulator's application of the M-ECPR fundamentally departs from traditional cost-of-service regulation.

### F. THE M-ECPR IS NOT FULLY DISTRIBUTED COST PRICING

The M-ECPR is not a form of fully distributed cost (FDC) pricing. To be sure, the M-ECPR is based on costs because it prices any network component at the sum of its incremental cost and plus opportunity cost. That exercise, however, need not entail the use of an arbitrary FDC allocation of joint and common costs. If the regulator preserves a structure of regulated rates, then any underlying cost allocation will be reflected in the calculation of wholesale rates by subtracting avoided incremental costs from retail rates. Any problems with the outcome in that case result not from the M-ECPR, but from the regulator's failure to rebalance regulated rates.

With resale competition and flexible prices the M-ECPR adjusts downward to reflect falling retail prices. That adjustment does not imply any reliance upon FDC cost methodology. Similarly, if there is facilities-based competition, no FDC methodology motivates the result under the ECPR that the incumbent LEC should price access at the incremental cost of the best alternative technology for the provision of network access.

# VII

## Did Professors Baumol, Ordover, and Willig Repudiate the M-ECPR?

In an affidavit filed on behalf of AT&T Corporation in the FCC's 1996 interconnection proceeding, William J. Baumol, Janusz A. Ordover, and Robert D. Willig implicitly endorsed the use of the M-ECPR for pricing mandatory network access but concluded that the proper price for the incumbent LEC to charge for mandatory network access under the Telecommunications Act of 1996 is total service long run incremental cost (TSLRIC).[1] The Baumol-Ordover-Willig affidavit prompted other economists retained by AT&T to assert in subsequent arbitration proceedings that even the creators of the rule assert it is inappropriate for determining the prices of unbundled elements.[2]

That assertion does not apply to M-ECPR and the caveats that Baumol, Ordover, and Willig expressed concerning the application of TSLRIC pricing. Moreover, the actual evidence on the existence of shared costs or common costs in the incumbent LEC's network revealed the factual error in the assumption that motivated the qualification raised by Baumol, Ordover, and Willig. Once the significance of that factual error is comprehended, there dissolves any

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1. Affidavit of William J. Baumol, Janusz A. Ordover, and Robert D. Willig on behalf of AT&T Corporation (May 17, 1996) [hereinafter Baumol-Ordover-Willig Affidavit], submitted in Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, Notice of Proposed Rulemaking, CC Dkt. No. 96-98, (released Apr. 19, 1996).

2. DAVID L. KASERMAN, JOHN W. MAYO, MICHAEL A. CREW, NICHOLAS ECONOMIDES, R. GLENN HUBBARD, PAUL R. KLEINDORFER & CAROLS MARTINS-FILHO, LOCAL COMPETITION ISSUES AND THE TELECOMMUNICATIONS ACT OF 1996, at 15 (July 15, 1996) (citations omitted).

apparent disagreement that might have existed between our assessment that the M-ECPR is appropriate for pricing the components of the local exchange network, and the contrary assessment by Baumol, Ordover, and Willig. Once these points of empirical misunderstanding are clarified, any such disagreement is revealed to be a false conflict, and it becomes clear that economic welfare would suffer if regulators rejected the M-ECPR in favor of a rule that priced mandatory access to the incumbent utility's network at TSLRIC.

### A. BAUMOL, ORDOVER, AND WILLIG ENDORSED THE ECPR FOR PRICING MANDATORY NETWORK ACCESS

In recognition of the seminal contribution that Baumol and Willig have made to the theory of network pricing, scholars and jurists routinely call the ECPR the "Baumol-Willig Rule." Predictably, Baumol, Ordover, and Willig said in their 1996 affidavit that they "continue to believe that principles of ECPR are valid and serve a useful regulatory role."[3] The FCC's unsophisticated caricature of the ECPR, however, naturally caused Baumol, Ordover, and Willig to applaud the agency's tentative rejection of the FCC-ECPR "in a form *supposedly* advocated by us" and to state politely that the FCC's rejection of the [FCC-ECPR] "[was] proper, although for reasons that differ somewhat from those articulated in the Notice."[4] In other words, Baumol, Ordover, and Willig evidently concluded that the FCC's stated criticisms of the pricing rule *that the agency incorrectly described as being the ECPR* were misplaced.

Given that the FCC's stated reasons for rejecting its understanding of the ECPR did not motivate Baumol, Ordover, and Willig to conclude that application of the rule (as they originally and correctly defined it) would not serve the public interest in the present case, then by what rationale did they decline to apply to local telephony in the United States the same rule for pricing inputs that they advocated in railroading, in electric power, and in local telephony in New Zealand? The answer lay in the critical assumptions that Baumol, Ordover, and Willig made in their 1996 affidavit concerning the size and makeup of the opportunity-cost component of the rule in the specific context of local telephony.

As we demonstrate in Chapter 3 of this report, the critical cost assumption made by Baumol, Ordover, and Willig is empirically

3. Baumol-Ordover-Willig Affidavit, *supra* note 1, at 8 ¶ 20.
4. *Id.* (emphasis added).

unsupported[5] Actual cost and price data confirm (1) that there are significant shared costs and common costs among network elements, such that pricing the incumbent LEC's wholesale and unbundled services at or near long-run incremental costs would fail to meet the statutory requirement that rates be just and reasonable and, in the case of unbundled elements, would exclude the reasonable profit allowed by statute; and (2) that there would be stranded costs *even if* the prices of wholesale and unbundled services were set according to the M-ECPR. Had Baumol, Ordover, and Willig been aware of such empirical evidence of the existence of economies of scope when assessing the suitability of the M-ECPR to the pricing of unbundled network elements in local telephony, their analysis would have led them to the same conclusion contained here: Pricing mandatory access to the incumbent LEC's network at TSLRIC would be insufficient on economic grounds to produce efficient incentives for entry and would be insufficient on economic (and constitutional) grounds to produce just compensation for government-ordered use of the LEC's property by its competitors.

### B. Does Stand-Alone Cost Equal Incremental Cost, and Are Shared Costs and Common Costs Trivial?

A supplier would not voluntarily invest in a transaction unless he expected the returns from the transaction to cover all its economic costs, including a competitive return to invested capital. As noted earlier, the supplier's cost of investing in the transaction would include the highest net benefit of all opportunities forgone that is, *opportunity cost*. The M-ECPR extends that logic to the mandatory sale of network access by specifying: "optimal input price = the input's direct per unit incremental cost + the opportunity cost to the input supplier of the sale of a unit of input."[6]

If the firm has economies of scale or scope, then its sale of network inputs to a competitor at incremental cost would not give the

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5. This view is also refuted by data presented to the FCC by Ameritech. For example, joint (or shared) costs are 12 percent, and common costs are 15 percent, of the total costs of Ameritech Illinois. Only 55 percent of the Ameritech Illinois's total costs are incremental to specific services as defined by the Illinois Commerce Commission. Comments of Ameritech Corporation at 63, submitted in *Interconnection NPRM*.

6. William J. Baumol & J. Gregory Sidak, Toward Competition in Local Telephony, (MIT Press & AEI Press 1994), at 94.

firm a sufficient contribution to cover its total costs. The sale of the input at incremental cost would entail an opportunity cost in the amount of the contribution to revenue adequacy that the regulated firm would forgo by selling the network element to a competitor rather than using that input itself to produce a final product whose price incorporated the requisite contribution margin. Stated differently, in the absence of government compulsion, no firm would sell an input to its competitor for less than the price that Baumol and Willig specified in their original exposition of the efficient component pricing rule. The rule, in other words, replicates the price that would result from voluntary exchange.

At the same time, the rule (1) establishes the proper incentives for efficient entry into the regulated market, and (2) ensures, when there are no competitive alternatives to the facilities necessary for access, that the price of government-mandated network access will not be so low as to be confiscatory under the Fifth Amendment.[7] Consequently, any pricing proposal for mandatory network access that would deviate from the rule must be scrutinized by regulators to ensure that it would not violate sound economic principles *and* constitutional protections against the uncompensated taking of private property.

The 1996 affidavit by Baumol, Ordover, and Willig, however, failed to provide either assurance. It assumed that an incumbent LEC would bear no opportunity cost by being required to sell unbundled network elements at TSLRIC. But that critical assumption had no empirical basis; indeed, as Part III of this report demonstrated, state PUC proceedings have received considerable empirical evidence substantiating the existence of shared costs and common costs in the provision of network elements necessary for local telephony. Stated differently, in their 1996 affidavit Baumol, Ordover, and Willig asserted that, if it were adjusted in the case of local telephony to reflect what they supposed was an absence of opportunity costs of any significant magnitude, the pricing rule would yield the following formula:

*Efficient price of aggregate network element =*
*TSLRIC of aggregate network element + 0.*

Indeed, that formula had to be the correct interpretation of the Baumol-Ordover-Willig position, because the term "opportunity costs" did not

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7. *See* J. Gregory Sidak & Daniel F. Spulber, *Deregulatory Takings and Breach of the Regulatory Contract*, 71 N.Y.U. L. REV. (forthcoming 1996).

appear in their affidavit despite its frequent use in their previous writings and testimony concerning the efficient component pricing. Baumol, Ordover, and Willig were able to conclude that the efficient price of unbundled network elements was TSLRIC, and to reach that conclusion in a manner consistent with their previous work on efficient component pricing, *only* because they assumed incorrectly, as it turned out that the incumbent LEC had "minimal or nonexistent" joint and common costs.[8]

Suppose, counterfactually, that the critical assumption of zero share costs or common costs were true. In that case, several remarkable conditions would obtain: (1) the local exchange would have no economies of scale or scope; (2) the local exchange market could be served just as efficiently by single-product firms, consistent with the classical definition of a perfectly competitive market; and (3) such technological conditions would obviate the access-pricing regime of the Telecommunications Act of 1996, as the services of the incumbent LECs' networks would be easily supplanted by competitive small-scale, single-product firms. If such a state of affairs existed, it would have been unnecessary for Baumol previously to have written:

> [E]ven if every one of a firm's services is sold at a price equal to its average-incremental cost, the firm's total revenues may not cover its total costs. Consequently, it is normal and not anticompetitive for a firm to price some or all of its products to provide not only the required profit component of incremental cost, but also some contribution toward recovery of common fixed costs that do not enter the incremental costs of the individual products . . . Any service whose price exceeds its per-unit incremental cost provides such a contribution in addition to the profit required on the incremental investment contained in the incremental cost.[9]

The opportunity-cost component of the rule seeks to generate for the firm the contribution to margin essential to recover the firm's unattributable costs and thus to ensure its continued solvency.

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8. Baumol-Ordover-Willig Affidavit, *supra* note 1, at 13 ¶ 35.

9. BAUMOL & SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY, *supra* note 6, at 102.

### C. COMMON COSTS AND SHARED COSTS BETWEEN AGGREGATE CATEGORIES, AND BETWEEN INDIVIDUAL NETWORK ELEMENTS

Baumol, Ordover and Willig asserted that, with regard to *aggregate* categories of network elements (loop, switching, transport, signaling), "[e]conomies of scope, or cost subadditivities, among these categories are likely to be minimal or nonexistent."[10] However, actual empirical evidence contradicts that assertion. But even if it were empirically supported, that assertion by Baumol, Ordover, and Willig would not preclude the existence of shared costs or common costs *within* any one of the aggregate categories of network elements. In other words, even if the statement by Baumol, Ordover, and Willig had been correct on its face as an empirical matter, it still could simultaneously be true that appreciable economies of scope exist among individual network elements within an aggregate category, such that setting prices at TSLRIC for unbundled services would surely fail to recover the totality of shared costs and common costs within that aggregate category. The incumbent LEC, after all, is not being asked by its rival to price *all* loops taken together or *all* switching taken together as a bundle, but rather to offer significantly finer disaggregations of its services. It is therefore significant that Baumol, Ordover, and Willig recognized: "The competitive price for any such subcomponent must lie between the subcomponent's unit long run incremental cost and SAC [stand-alone cost]."[11] In other words, by their own analysis Baumol, Ordover, and Willig acknowledged that pricing access TSLRIC cannot recover shared costs and common costs.

Baumol, Ordover, and Willig further argued that the prices for unbundled network services should be priced above their incremental costs to recover shared costs and common costs, which within their framework equals "the difference between the TSLRIC of an aggregate of outputs, and the sum of the TSLRICs of each subset of those outputs."[12] According to Baumol, Ordover, and Willig, those costs "should be assigned to individual network elements on an efficient and competitively neutral basis."[13] Likewise, our earlier discussion of efficient component pricing showed that those costs should be recovered through prices on unbundled network services that exceed

10. Baumol-Ordover-Willig Affidavit, *supra* note 1, at 13 ¶ 35.
11. *Id.* at 5 n.1.
12. *Id.* at 14 ¶ 37.
13. *Id.*

the TSLRICs for those services. Those costs should be recovered whether they are small or significantly large in which case, as Baumol, Ordover, and Willig observe, "the method of revenue recovery should be consistent with allocative and competitive efficiency."[14] That outcome could only be achieved by pricing above the incremental costs of the unbundled network services, according to the formula that Baumol and Willig had previously advocated elsewhere:

*Efficient price of unbundled network element*
*= TSLRIC of unbundled network element*
*+ opportunity cost.*

Our analysis concurs with the conclusion by Baumol, Ordover, and Willig that such recovery of costs should be bounded above by stand-alone cost, which would properly include any shared costs and common costs, and that the access price "should be no higher than the imputed price charged by the ILEC to itself in the context of a competitive offering."[15]

### D. CAN INCUMBENT LECS EARN MONOPOLY PROFITS?

Baumol, Ordover, and Willig expressed concern in their 1996 affidavit that existing rate structures for incumbent local exchange carriers included monopoly profits, which they believed could be passed on to entrants in access prices determined according to the ECPR.[16] That assertion, however, like their earlier assertion that shared costs and common costs in local telephony were insignificant, did not rest on any empirical evidence. Further, it was inconsistent with the history of price regulation of incumbent LECs, which has controlled their earnings either through traditional cost-of-service regulation or through incentive regulation.

Moreover, any returns that the LECs might have obtained from achieving cost efficiencies under incentive regulation were an intended consequence of such regulation; for the regulator to eliminate those returns retroactively would amount to a breach of the most essential element in the bargain that the LEC and the regulator struck when replacing rate-of-return regulation with incentive regulation.

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14. *Id.*
15. *Id.* at 14 n.7.
16. Baumol-Ordover-Willig Affidavit, *supra* note 1, at 8 ¶ 23.

Those returns in any case have been limited by sharing rules and other regulatory constraints.

Finally, the assertion that regulators had been allowing incumbent LECs to earn monopoly profits was inconsistent with the incumbent LECs' existing and continuing obligations to serve. The opportunity-cost component of the efficient component pricing will necessarily be positive, Baumol had previously noted, "when a regulated firm has special-service obligations imposed upon it,"[17] as has been the case with any incumbent LEC. Elaborating on this point, Baumol has written:

> Examples include the arrangement under which the input supplier is also forced to serve as the "carrier of last resort," or when, as in the case of Telecom Corporation of New Zealand, the carrier is required to supply services to residential customers at rates that it claims to be insufficient to cover the pertinent incremental costs. *These obligations are appropriately treated as sources of common fixed costs for the firm; the costs must be covered legitimately by the firm's prices* and be taken into account in calculating its stand-alone-cost ceilings [for final-product prices].[18]

Far from reducing the size of such public-service obligations borne by incumbent LECs, the Telecommunications Act of 1996 increased their obligations by creating new unbundling requirements and more expansive universal service obligations.

### 1. STRANDED COST RECOVERY THROUGH COMPETITIVELY NEUTRAL END-USER CHARGES

In their 1996 affidavit, Baumol, Ordover, and Willig advocated keeping cross-subsidies to a minimum: "A deliberate wedge between prices and TSLRIC is most likely to result from a decision to subsidize

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17. BAUMOL & SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY, *supra* note 6, at 108.

18. *Id.* at 108-09 (emphasis added) (citing Clear Communications, Ltd. *v.* Telecom Corp. of New Zealand, Ltd., slip op. (H.C. Dec. 22, 1992)).

universal service and other regulatory goals."[19] That is because pricing below incremental costs for some services requires obtaining subsidies elsewhere, encourages excess demand for those services, and harms the financial solvency of the incumbent, thus placing it at a disadvantage relative to entrants. Furthermore, obtaining those subsidies by adding overcharges to other services inefficiently reduces demand for those facilities and places the incumbent at a competitive disadvantage to entrants that can price flexibly, which leads to inefficient bypass of existing network facilities. This analysis by Baumol, Ordover, and Willig concurs with our conclusion in Part III that the rates of the incumbent LECs should be rebalanced to eliminate cross-subsidization.

Baumol, Ordover, and Willig also advocated competitive neutrality of funding and distribution mechanisms. That requires that regulatory obligations, price regulations, and unbundling requirements neither penalize nor reward incumbents or entrants. Baumol, Ordover, and Willig cautioned that deviations between prices and economic costs should not be allowed to distort competition between the incumbent LEC and its potential rivals: "To be competitively neutral, a regulatory wedge between prices and TSLRIC must never favor entrants over incumbents, or *vice versa*."[20] They elaborated:

> The reason is obvious: any such departures from competitive neutrality tend to channel business to inefficient suppliers. This inefficient allocation of business will raise costs, repress innovation and investments and as usual when competition is diverted needlessly burden consumers.[21]

But as Baumol had previously emphasized elsewhere, economic logic implies that this principle be applied not only to specific subsidies (for example, universal service), but to *all* pertinent costs, including the cost of regulatory obligations past, present, and future. The entry of competitors not burdened by such expenses raises the prospect that such costs will be stranded:

> Stranded costs are those costs that utilities are permitted to recover through their rates but whose

19. Baumol-Ordover-Willig Affidavit, *supra* note 1, at 21 ¶ 60.
20. *Id.* at 21 ¶ 61.
21. *Id.*

> recovery may be impeded by the advent of competition in the industry. Those costs represent expenditures incurred by a utility in the past in meeting its obligation to serve all customers within the areas in which it held an exclusive franchise, granted to it in the traditional regulatory regime.[22]

Baumol argued that such stranded costs should be recovered:

> The cost of recoupment of stranded costs can be considered part of the common costs to which the price of inputs supplied by the utility to other firms can appropriately contribute or even cover completely. A cost imposed by regulatory arrangements is a real cost for the enterprise as any other, and an input price that helps to cover that cost is merely contributing to adequacy of revenues for the firm.[23]

If regulators "omit or limit recovery of portions of opportunity costs," Baumol concluded, their "pricing policies will undermine economic efficiency."[24]

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22. WILLIAM J. BAUMOL & J. GREGORY SIDAK, TRANSMISSION PRICING AND STRANDED COSTS IN THE ELECTRIC POWER INDUSTRY, (AEI Press 1995), at 98.

23. *Id.* at 147.

24. *Id.*

As stated earlier, the M-ECPR implies that an incumbent LEC's price for an unbundled network element should equal its long-run incremental costs plus its opportunity cost. But competition constrains the latter: The presence of facilities-based entry, and the possibility that entrants may purchase services under existing retail rates that are substitutes for the unbundled network elements of the incumbent LEC, reduce the likelihood that the incumbent will recover its total costs. That is because the incumbent's price will be constrained by the stand-alone cost of the best alternative. It therefore bears repeating that M-ECPR pricing is not fully compensatory. Thus, as Baumol, Ordover, and Willig advocated, state regulators should consider rate rebalancing *before* imposing a system of prices for wholesale services and unbundled network elements. If, however, the state regulator chooses not to rebalance rates, then, to preserve the existing contribution in the incumbent's existing rate structure, a system of end-user charges must accompany the pricing of wholesale services and unbundled network elements. As Baumol argued recently, "the efficient-component pricing rule, and the competitive model of which it is a constituent part, equip [regulators] to resolve [network] pricing and stranded cost disputes in the public interest."[25]

Baumol, Ordover, and Willig emphasized in their 1996 affidavit that cost must be examined on a forward-looking basis. That position necessarily applies to the future cost of regulatory obligations newly imposed on incumbent LECs by the Telecommunications Act of 1996. The act imposes six specific obligations on incumbent LECs, all of which will impose costs on a forward-looking basis that are not borne by potential entrants. One such costly obligation is the duty to provide interconnection to any requesting telecommunications carrier at "any technically feasible point within the carrier's network."[26] Equivalent access requirements apply to unbundled network elements. The costs of those newly established obligations will be stranded unless they are either (1) recovered through competitively neutral charges, as Baumol, Ordover, and Willig advocated in their affidavit and as we advocated in Chapter III of this report, or (2) included in the TSLRIC for a service.

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25. *Id.* at 158.
26. 47 U.S.C. § 251(c)(2)(B).

In sum, our analysis is consistent with the recommendation of Baumol, Ordover, and Willig that the wedge between prices and costs be recovered in a competitively neutral manner. The relevant cost need not equal the incumbent's TSLRIC, however, but rather may equal the stand-alone cost of the best alternative. In their 1996 affidavit, Baumol, Ordover, and Willig accepted unquestioningly that the incumbent LEC's TSLRIC exactly equaled the stand-alone costs of potential entrants. In contrast, we regard that question as an empirical matter to be determined in competitive markets. Contributions to universal service funds, to shared costs and common costs (which will be present if the incumbent LEC's TSLRICs are less than the entrant's stand-alone costs), and to other regulatory obligations that cannot be recovered in competitive markets are appropriately collected through competitively neutral charges that do not distort consumption and investment decisions. That was precisely the recommendation of Baumol, Ordover, and Willig in their 1996 affidavit when one follows their proposal for universal service funding to its logical economic conclusion.

## F. SUMMARY

Did the creators of the efficient component pricing rule reject the application of M-ECPR to the pricing of unbundled network elements in local telephony? Contrary to the assertions of some economists, the answer is no. The analysis of Baumol, Ordover, and Willig in their 1996 affidavit can be entirely reconciled with our analysis here. On the two most important regulatory questions concerning competition in local telephony, Baumol, Ordover, and Willig were in agreement with the analysis presented here. First, the efficient component-pricing rule is the proper method to price mandatory network access; mandatory access to the incumbent LEC's network should be no exception. Second, even when the M-ECPR is correctly administered, its automatic adjustment of the incumbent LEC's opportunity costs on a forward-looking basis will require regulators to impose competitively neutral charges to recover the LEC's stranded costs. The price of unbundled access must allow a market-allowed contribution to shared costs and common costs, over and above TSLRIC.

# VIII

## M-ECPR Pricing Should Be Applied to Resale and Unbundled Network Services

The Kaserman Report asserts that application of the efficient component pricing "leads to a lessening of competition resulting in allocative, productive, and dynamic inefficiencies" and that the rule itself "proposes that an incumbent be fully compensated for its book costs, however inflated these may be."[1] This chapter illustrates that the Kaserman Report mischaracterizes efficient component pricing and, as a result, misrepresents the efficiency and compensatory aspects of the rule. We illustrate that M-ECPR addresses a familiar problem facing the regulated multiproduct firm that is ignored by the Kaserman Report. If the firm has economies of scale or scope, then its sale of unbundled elements to a competitor at TELRIC would fail to give the firm sufficient revenues to cover its total costs. The sale of the input at incremental cost would entail an opportunity cost in the amount of the contribution to revenue that the regulated firm would forgo by selling the network element to a competitor rather than using that input itself to produce a final product whose price incorporated the contribution margin. Stated differently, in the absence of government compulsion, no firm would sell an input to its competitor for less than the price implied by the M-ECPR. The rule, in other words, replicates the price that would result from voluntary exchange. That is the price that will produce economically efficient outcomes.

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1. Kaserman Report, at 14.

### A. M-ECPR PRICING IS EFFICIENT AND COMPENSATORY BECAUSE IT RECOVERS ECONOMIC COSTS

M-ECPR pricing is efficient because it exactly recovers the LEC's economic costs. If the inputs supplied to competitors are standard components purchased in the marketplace, then the purchase cost of those inputs is their economic cost. For these types of inputs, as would be expected, the M-ECPR price is exactly equal to the market price. This is consistent with the M-ECPR formula, even if the firm is a producer of the input. The opportunity cost of selling such an input is the difference between the market price of the input and the firm's incremental cost of producing the input. Thus, the M-ECPR price, which is the sum of the firm's incremental cost and the opportunity cost of selling the input, is equal to the market price.

If the inputs supplied to competitors are created by the incumbent LEC, as is the case for certain unbundled services, and there is no viable market alternative, then the economic cost must be imputed. For a firm subject to regulation of its rates, either through cost-of-service regulation, incentive regulation involving price-caps, or some other method, the opportunity cost of supplying an input to competitors equals the earnings forgone by the LEC that could have been obtained had the LEC employed that input in providing service to end users. These earnings or net revenues forgone are not difficult to measure since any regulated company maintains records of its costs and revenues that can serve to provide estimates of earnings forgone in a straightforward manner.

It should be stressed that the forgone net revenues of the incumbent LEC are not independent of the LEC's economic costs. Under cost-of-service regulation, the revenues of the firm are equal to its operating cost plus a reasonable profit. Thus, the rates of the firm, which have been subject to approval by regulators, allow the firm to earn revenues that cover the total costs of providing its services, including any shared costs and any common costs. Under incentive regulation involving price-caps, or some other method, the initial rates were established with reference to the regulated LEC's cost of service. Moreover, the net revenues must stay within a range that is determined with reference to the firm's costs and the revenues that are subject to regulatory sharing rules. The forgone revenues of the firm subject to incentive regulation cannot exceed revenues determined by cost-based price caps.

If the inputs supplied to competitors are created by the incumbent LEC and are also available from competitors, the correct measure of their economic cost is the market price of the input as supplied by the competitors of the LEC. That price provides the correct economic indicator of the input's value in its best alternative use. Therefore, with facilities-based competition, there will exist market prices for some unbundled services that provide a guide to estimating their best alternative use.

Contrary to the assertion made in the Kaserman Report, the M-ECPR is forward-looking because it allows prices for unbundled network services to adjust to reflect cost efficiencies and competition. Flexibility can be achieved by creating a system of price caps that use M-ECPR prices as the initial prices. Such M-ECPR-base price caps would provide incentives for the regulated firm to adjust prices downward to respond to competition. They would also provide incentives for future cost reductions. In the case of prices for resale services, these prices fall as retail cost efficiencies and competition drive down the retail price. For unbundled network services, prices would fall as competitive entry of facilities-based carriers caused market prices to fall. Falling market prices for unbundled network services would reduce the incumbent's opportunity costs. M-ECPR is forward-looking because it is based on *opportunities forgone*, which is a forward-looking method of evaluating the costs of alternative decisions. This is why the M-ECPR permits adjustment to market conditions.

### B. M-ECPR PRICING IS COMPENSATORY BUT IT IS NOT A "MAKE WHOLE" DEVICE

The M-ECPR has important compensatory properties in that it covers the incremental costs plus opportunity costs of the incumbent LEC. This attribute also allows recovery of regulated investment under resale competition. When prices fall solely due to the forces of resale competition, reduction of wholesale prices for services sold at retail still allows the incumbent to recover its costs. The additional volume contributes additional wholesale revenues allowing for full recovery of regulated investment. However, the M-ECPR generally does *not* guarantee full cost recovery with facilities-based competition.

When there are alternative facilities-based access suppliers, the market price of services provided using those facilities determines the opportunity costs of unbundled network services. The economically correct measure of the LEC's opportunity cost of selling

an unbundled network service (such as a port or a loop) is the difference between the market price of the service and the LEC's incremental cost. The M-ECPR then says that the price of the service should be the sum of the LEC's incremental cost and the opportunity cost, which exactly equals the market price. Thus, the M-ECPR price always equals the price of the best alternative.

To illustrate with a simple example, suppose that the best market alternative is the service of loops priced at $25. The LEC's incremental cost of loops is $10. Therefore, its opportunity cost of selling the services of a loop to a competitor is $25 minus $10, which equals $15. The M-ECPR price (incremental cost plus opportunity cost) is simply:

$$\text{M-ECPR Price} = \$10 + (\$25 - \$10) = \$25.$$

Whenever there are market alternatives, the M-ECPR price should equal the lowest-priced alternative.

Thus, properly calculated, M-ECPR pricing takes into account market constraints on the contribution that the incumbent's revenues are able to make to the recovery of shared costs and common costs. Prices for resale and unbundled network services must be lowered to meet the competition in good faith.

It is likely that market alternatives will lower the revenues of the LEC below the "make whole" level. In other words, the LEC will not be "fully compensated for its book costs" as the Kaserman Report alleges. The reasons for this shortfall are many. Market alternatives embody the lowest cost technology. With cost-reducing technological change, obsolescence will cause prices to fall below levels expected under regulation. This does not indicate the presence of inefficiency or imprudence on the part of the LEC. All private investment decisions and private contractual agreements are subject to the same risk that lower cost alternatives will appear in the future.

In addition to technological change, the incumbent is likely to have higher costs than entrants because the incumbent continues to bear regulatory obligations such as carrier of last resort, universal service, and other regulatory incumbent burdens. In addition, the incumbent must satisfy new unbundling and access regulations. Entrants are not subject to these costly regulations. Thus, competitively supplied network elements provide a low-price alternative.

Moreover, entrants can "pick and choose" the customers and service areas to target, focusing on lower-cost, high-density areas.

They need not recreate the incumbent's network, so that the best market is likely to be below the incumbent's unit cost. Again, the best market alternative will be a low-cost option.

Therefore, pricing at the M-ECPR price when facilities-based market alternatives are present generally will prevent the incumbent LEC from recovering its total costs. This means that M-ECPR pricing is not a "make whole" device.

With facilities-based competition, remaining regulatory obligations and continuing incumbent burdens require that M-ECPR pricing be supplemented by a competitively neutral funding mechanism. Such a mechanism would be necessary to allow the LEC to recover its total costs, including the cost of meeting continuing regulatory obligations. This also could involve charges for a universal service fund recovered from all telecommunications carriers.

### C. M-ECPR Pricing Satisfies Static and Dynamic Efficiency

The M-ECPR has both static and dynamic efficiency properties when the incumbent firm has pricing flexibility for resale and unbundled services. The M-ECPR is economically efficient because access is priced at economic costs, that is, incremental costs plus opportunity costs. Those purchasing wholesale services, unbundled network elements, or interconnection thus receive accurate price signals. Otherwise, services priced below costs, in the absence of market alternatives, would encourage overuse; conversely, overpriced services would discourage productive use of the telecommunications network.

Moreover, the M-ECPR satisfies dynamic efficiency in terms of investment in alternative facilities and entry decisions of competitors. If services were priced below their economic costs, then, in the absence of market alternatives, provision of services by facilities-based competitors would be discouraged; conversely, overpriced services would produce uneconomic bypass. By pricing services at the incumbent's economic cost, the M-ECPR provides efficient investment incentives. The rule provides incentives for efficient entry when resellers use the incumbent's existing facilities. In that case, entry occurs if and only if entrants are at least as efficient as the incumbent in retailing. The M-ECPR further provides incentives for efficient entry with facilities-based competition.

The M-ECPR exhibits efficiency properties with facilities-based competition. Following M-ECPR principles, the LEC's unbundled network should be priced at the cost of the best alternative,

which allows prices to fall based on the efficiency of facilities-based entrants. Pricing at the cost of the best alternative allows the market to determine the price of unbundled components. For equipment (such as switches) used as inputs to telecommunications, the price is determined by the purchase price, installation, and operating costs of the equipment. For inputs such as unbundled loops that are manufactured by facilities providers, the cost of the best alternative is the market price of transmission capacity supplied by facilities-based entrants. The market is the best determinant of the efficient pricing of network services. M-ECPR pricing is efficient because it is based on market benchmarks.

### D. THE M-ECPR IS NEITHER AN ENTRY BARRIER NOR AN INCUMBENT BURDEN

The Kaserman Report also alleges that M-ECPR pricing is an entry barrier. Again, this assertion is based on a flawed understanding of the pricing rule. M-ECPR pricing exactly equals the incumbent's economic cost; it neither penalizes nor subsidizes entrants. With the M-ECPR, competitors must make efficient entry and investment decisions.

Pricing services below their M-ECPR price would lead to free riding by entrants, and excessive use of the underpriced facilities by resellers and others combining components to create networks. Such underpricing would discourage efficient competitors from constructing facilities.

Pricing services above their M-ECPR price would cause bypass of the overpriced facilities by resellers and others combining components to create networks. Such overpricing would encourage less efficient competitors to construct competing facilities, thus raising the total costs of telecommunications unnecessarily due to uneconomic duplication.

With resale competition only, and M-ECPR pricing, entrants resell service if and only if they are efficient -- that is, if their retailing costs are equal to or less than those of the incumbent LEC. The recovery of the LEC's retail rate net of avoided retail costs provides the right signal to competitive entrants. The LEC is indifferent between selling the service at retail or at wholesale. Entrants make the correct entry decision given the discount for the avoided retailing cost. As entrants bring retailing efficiencies, the retail price will fall; and given the discount for the avoided retailing cost, wholesale prices will fall by the same amount.

With resale competition, when there is product differentiation or branding of telecommunications services, as seems likely, the M-ECPR allows efficient entry and an increase in product variety as well. Then, even less cost-efficient entrants offering the benefits of differentiated products are able to make efficient entry decisions.

With facilities-based competition, M-ECPR pricing also provides incentives for efficient entry. Facilities-based entry is efficient if the marginal benefits to consumers of increases in transmission capacity (beyond those available using the incumbent's network) are at least as great as the cost of additional capacity. Entrants make efficient investment and entry decisions to create additional capacity only if the price for the incumbent's capacity equals the incumbent's average incremental costs of providing that capacity plus the incumbent's opportunity cost. It is efficient for the entrant to construct additional facilities only if it is profitable for the to do so at a price that is equal to or less than the M-ECPR price. Thus, the M-ECPR price is efficient because it sends the correct price signals to competitive entrants.

### E. M-ECPR Pricing Reflects Forward-Looking Costs

M-ECPR pricing yields revenues that are less than or equal to the replacement costs of the firm. Thus the M-ECPR reflects forward-looking costs and provides correct economic signals to telecommunications customers. This is precisely why application of the M-ECPR is consistent with the FCC's August 1996 Interconnection Order.

The M-ECPR is forward-looking because it allows prices for network services to adjust to reflect cost efficiencies and competition. M-ECPR-based price caps provide incentives for the regulated firm to adjust prices downward to respond to competition. They also provide incentives for future cost reductions. In the case of wholesale prices for resale services, these prices fall as retail cost efficiencies and competition drive down the retail price. The M-ECPR is forward-looking because it is based on opportunities foregone. This is why it permits adjustment to market conditions. Opportunity costs are always prospective because they address the potential costs and benefits of economic decisions.

The M-ECPR price equals forward-looking incremental cost plus opportunity cost measured in terms of net earnings forgone by selling the productive input to a competitor. The present discounted

value of the expected net earnings stream is a forward-looking measure of earnings.

The present discounted value of expected net earnings is equal to the value of the firm based on standard finance analysis. For firms financed through debt and equity, the value of the firm equals the market value of the firm's debt and equity. A "fair" rate of return for a regulated firm has generally been understood as being equal to the regulated firm's cost of capital.[2] If a firm earns a return equal to its cost of capital, the market value of the regulated firm should equal its rate base, however it is valued. If the rate base is valued on the basis of historical cost, this measure of value can depart from replacement costs, depending upon technological change and changes in input prices. If replacement costs are above historical costs, then pricing based on regulated revenues is below replacement costs. If replacement costs are below historical costs, then pricing based on regulated revenues will yield earnings above replacement costs. To reflect replacement costs, the pricing method must therefore be one that adjusts depending upon whether replacement costs are above or below historical costs. As we will demonstrate, that is precisely what the M-ECPR does.

Replacement costs are the forward-looking costs of a firms assets. It has been observed that replacement "does not mean simply the minimum cost of producing an asset which performs the same function, but rather the cost of the most efficient alternative method for satisfying the required demand."[3] When competing market alternatives are not available, the costs of the regulated LEC provide a lower bound for replacement costs. When competing market alternatives are available, however, those alternatives provide the best indicator of replacement costs. Setting prices based on replacement costs is desirable because it provides the correct pricing signals to customers regarding the economic costs of providing a service.

M-ECPR pricing performs this function effectively. If facilities-based entry is not feasible, then the replacement costs of assets would be expected to exceed their historical costs. In that case, the M-ECPR prices, which are chosen based on the expected revenues that the regulated firm would earn, yield revenues that are less than or equal to replacement costs. Alternatively, facilities-based entry is

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2. See Bruce C. Greenwald, *Rate Base Selection and the Structure of Regulation*, 18 RAND J. OF ECON. 85 (1984); S. C. Myers, *The Applications of Finance Theory to Public Utility Rate Cases*, 3 BELL J. OF ECON. 58 (1972).

3. Greenwald, *supra* note 2, at 94.

feasible, then M-ECPR pricing is pegged to the price of the best alternative, which exactly equals the replacement cost of the facilities. Therefore, M-ECPR pricing *always* yields prices that are less than or equal to replacement costs. M-ECPR pricing thus provides an effective method of pricing based on forward-looking costs.

### F. M-ECPR PRICING IS NONDISCRIMINATORY

Because M-ECPR pricing recovers the LEC's economic costs -- that is, incremental cost plus opportunity cost -- it satisfies the requirement in Section 252(b)(3) that pricing of resale and of unbundled elements not be discriminatory. If prices for resale and unbundled network services were set below the LEC's economic costs (as the Kaserman Report recommends), then such pricing would be discriminatory, thereby violating the requirements of the *Act*. Entrants providing facilities-based services will not choose to provide such services unless they can recover the economic cost of those services. Thus, a firm will not enter the market and construct facilities unless it expects to earn revenues that cover its entry and operating costs. To price the facilities of the LEC below their economic costs would deny the same opportunity to the LECs. Thus, such below-cost pricing would discriminate against incumbents in favor of entrants. It would subsidize entrants at the expense of incumbents, which would necessarily entail discrimination between the two types of firms. Because TELRIC pricing fails to cover the incremental costs of *combinations* of services, it necessarily creates discriminatory pricing whenever shared costs are present.

The M-ECPR, in contrast, sets prices on the basis of economic costs in the manner that a competitive firm would price access to its facilities. Thus, M-ECPR does not discriminate between entrants and incumbents.

### G. M-ECPR PRICING IS A GOOD START TOWARD REBALANCING RATES

As we show, TELRIC pricing is likely to fail the incremental cost test to determine whether a price structure is subsidy free. This is because whenever any group of services has shared costs, which is a common occurrence in telecommunications networks, TELRIC pricing will not yield revenues that cover the incremental costs of that group of services.

M-ECPR pricing is a good start toward rebalancing rates. As with TELRIC pricing, each service yields revenues that cover its incremental cost. However, M-ECPR pricing does more. By including the opportunity cost of each service, M-ECPR makes it more likely that any group of services will cover the incremental costs of that group of services. The M-ECPR is therefore more likely than TELRIC pricing to pass the incremental cost test by ensuring that services at least cover their incremental cost. This makes a good start toward rebalancing rates.

The M-ECPR yields revenues that cannot exceed the regulated LEC's costs due to regulatory constraints, and indeed those revenues usually will fall below regulated costs due to competitive market alternatives. Services that have competitive market benchmarks must of necessity cover their incremental costs. Thus, M-ECPR pricing, based on regulatory and market benchmarks, represents an allocation of shared costs or common costs that will be more likely to pass the incremental cost test, which applies to any combination of services.

### H. M-ECPR PRICING DOES NOT PROTECT "MONOPOLY RENTS"

The Kaserman Report asserts that the M-ECPR methodology protects monopoly rents that would otherwise accrue to the incumbent LEC's bottleneck facilities, and that the rule thereby deters welfare-enhancing entry. This criticism lacks both a factual and an economic foundation. The M-ECPR is designed to recover the incumbent LEC's economic costs of providing resale and unbundled network services.

The Kaserman Report's criticism of M-ECPR starts from a counterfactual assumption, that the incumbent is earning monopoly rents. Presumably if it were, this fact would manifest a failure of regulation that should be corrected directly rather that through access pricing. It is certainly possible that specific services contain markups that are used to provide subsidies for other services of the regulated LEC that are provided below cost. Then, the recovery of those contributions to margin may represent a preservation of some cross subsidies that are left in place by rate regulation. It would be misleading, however, to interpret this situation created by the existing regulated rate structure as a preservation of monopoly rents. It is preferable to eliminate the system of cross subsidies by rebalancing the rate structure, rather than selectively pricing some access services based on costs while at the same time pricing other services *below* cost. Such a selective approach not only is inconsistent, but represents

a fundamental breach of the regulatory contract by not allowing the regulated firm the opportunity to recover its costs.

If facilities-based competition is not feasible, the basis for the opportunity cost calculation is the incumbent LEC's regulated margins. If the LEC is subject to price caps and sharing rules, these features further constrain its earnings. Thus, the economic rents of the LEC are limited by regulation.

When there is facilities-based competition, the M-ECPR methodology requires pricing at the best alternative price, even if that price lies below regulated margins. Thus, M-ECPR pricing cannot be said to protect those margins from competition. To the contrary, the M-ECPR method requires repeatedly adjusting the access price to equal the market price of the best alternative.

Moreover, the facilities of the incumbent LEC are far from being "essential." Entry barriers to facilities-based competition are not insurmountable, as evidenced by the substantial investment in facilities that has already occurred in the local exchange. In addition, technological change has lower the need to make irreversible, transaction-specific investment. Wireless technologies and other methods of transmission lower the specificity of entry costs in comparison with traditional technologies. Given current technology, there is little basis for considering the local exchange to be a bottleneck monopoly. The rents to facilities thus are limited by the cost of the best competitive alternative.

Thus, the monopoly-rents criticisms of M-ECPR in deregulated telecommunications markets rely on counterfactual assumptions. Regulation that existed before the opening of the market has served to limit monopoly rents; and if it has not, then any alleged regulatory failures should be corrected directly. Selective departures from an economically efficient pricing method will not yield either efficient or compensatory pricing of network access.

Beyond positing counterfactual assumptions, the related theoretical case against the M-ECPR makes unrealistic assumptions and errors of reasoning. There are several additional ways in which the "monopoly rents" criticism is misguided. For example, the Kaserman Report cites an article by Nicolas Economides and Lawrence White that alleges that, if the M-ECPR price is above marginal cost, there is an efficiency distortion.[4] The reasoning of

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4. *See* Nicholas Economides & Lawrence J. White, *Access and Interconnection Pricing: How Efficient Is the "Efficient Component Pricing Rule"?*, 40 ANTITRUST BULL. 557 (1995). See also the critique of Economides and White in Alexander C.

Economides and White proceeds as follows. Because the M-ECPR price entails a markup above marginal cost (in their setting, marginal and incremental cost coincide), any lowering of prices toward marginal cost must improve welfare. Entry by a less efficient competitor that is, a competitor with marginal costs *greater than* those of the incumbent - will lower prices. Therefore, they assert, such inefficient entry improves welfare by lowering prices. Because the M-ECPR deters this type of inefficient entry, they conclude that the M-ECPR must not be efficient.

Each step of that reasoning is flawed. Are all markups above marginal costs inefficient? Surely not, since markups are a common feature of competitive markets, where firms cover fixed costs, or shared costs and common costs, through markups. Their objection to the M-ECPR seems to be that it involves a markup over marginal cost, which is an objection that would apply equally to *all* markups - such as average cost pricing or Ramsey pricing, where fixed costs, or shared costs and common costs, are recovered through markups.

This criticism is clearly misguided because it is directed at constant per-unit pricing *in general*, not at M-ECPR pricing in particular. The M-ECPR pricing method allows any type of pricing to recover incremental cost plus opportunity cost. Firms charge customers a two-part tariff consisting of a usage charge and a connection charge. The usage charge can be a marginal cost price. The connection charge is a per-customer charge that recovers the difference between the M-ECPR amount and the amount recovered through marginal cost pricing. Then, based on well-known economic analysis, competition between firms offering two part-tariffs assures an efficient outcome. Two-part tariff competition for the market eliminates excess profit, eliminates cross subsidies, and allows efficient entry.[5]

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Larson, *The Efficiency of the Efficient Component-Pricing Rule: A Comment*, ANTITRUST BULL. As Larson shows, the article by Economides & White has several problematic features (1996) forthcoming:

> The three major weaknesses of the analytic framework Economides and White employ are: (1) the assumption of monopoly pricing in the downstream market; (2) the assumption of Bertrand-like limit pricing in the downstream market once entrants purchase the required upstream productive inputs; and (3) the market price elasticities of demand that Economides and White assume for the downstream market.

5. This analysis is carried out in DANIEL F. SPULBER, REGULATION AND MARKETS 209-20, 260-61 (MIT Press 1989).

Consider the assertion by Economides and White that inefficient entry improves welfare. Inefficient entry does nothing more than raise total production costs for the industry. This cannot be a desirable outcome. Yet the objection of Economides and White to the M-ECPR is that such inefficient entry is deterred. This outcome cannot be a problem with M-ECPR. Rather, it is a virtue of pricing that reflects economic cost.

Because Economides and White object to any pricing above marginal cost, they would prefer that all regulated facilities be priced at marginal cost. If the incumbent firm is not to incur losses, marginal cost pricing requires either instituting a system of two-part tariffs or establishing an alternative means for cost recovery.

Economides and White assume that the incumbent possesses an essential facility that resembles manna from heaven. In their framework, the entrant cannot duplicate the facility at *any* price, yet the incumbent seems to have acquired the facility without incurring any cost. The facility is infinitely costly for the entrant and free for the incumbent. That assumption is certainly unrealistic. In fact, transmission facilities are costly to establish for incumbents and can be constructed by an entrant at some cost that may be greater, equal to, or less than that of the incumbent. If the incumbent incurred a cost in constructing the facility, then the alleged "profit" is little more than net revenue. The net revenue of the incumbent could be larger than, equal to, or less than the cost that the incumbent incurred in creating the facilities. Thus, even though the incumbent's retail price involves a markup above marginal cost, the incumbent's net revenue does not represent economic profit, but merely a recovery of investment. If the incumbent's net revenue is less than the cost of creating the facilities, including the costs of capital, then the incumbent could be making a *loss*, even with a positive markup over marginal cost. By ignoring the costs of establishing facilities in their assertion that the incumbent is making profit (really a short-run operating profit), Economides and White effectively assert that positive operating margins are not efficient, thus ignoring the recovery of, and return to, capital provided by net revenues.

In sum, although the opportunity-cost of selling facilities can include monopoly rents, if such rents are present, that fact does not indicate a problem with M-ECPR. Rather, it is a feature of the existing market. Yet, such a situation is *not* consistent with effective regulation. If the criticism of M-ECPR is based on the assumption that regulation is ineffective, then the solution is to fix the regulatory problem, not to redistribute income across firms. Moreover, the

opportunity cost component of the M-ECPR is limited by the cost of the price of the best alternative net of the incumbent's incremental cost. By assuming that alternatives are prohibitively costly, Economides and White stack the deck. As long as there is the potential for entry of facilities-based competitors, the rents on the incumbent's facilities are limited by the cost of competitive alternatives.

## I. M-ECPR PRICING IS STRAIGHTFORWARD TO CALCULATE

M-ECPR pricing is straightforward to calculate, whether applying the "top down" method for existing retail services, or the "bottom up" method for unbundled network elements. For existing retail services, subtracting avoided retail costs, in accordance with the *Act*, is a straightforward calculation using existing retail rates. If a market retail benchmark is used, it is equally straightforward to net out the same avoided retail costs.

For unbundled network services, the M-ECPR has a distinct advantage over methods that require a "fully distributed cost" allocation methodology. Not only are such allocations necessarily arbitrary, but they require complicated data regarding the variable used to determine the allocation of shared costs or common costs, such as relative cost or usage measures. For those facilities for which there are market benchmarks, which includes certain types of equipment, the M-ECPR price is simply the market price of comparable facilities. For those facilities for which there is an *internal benchmark* available to customers, such as some types of loops, the M-ECPR price, again, is simply the existing price of the internal benchmark.

For those remaining facilities for which a market price or internal benchmark price is not available, it is still straightforward to apply the M-ECPR formula. The TELRIC component of the M-ECPR is available from internal cost studies. The opportunity-cost component is obtained by calculating the forgone net earnings from that service. That calculation generally is straightforward because the market prices of other components can be netted out from earnings to obtain the remaining earnings forgone. Because sufficient market benchmarks are available, as our numerical analysis demonstrates, that such approach avoids the unnecessary complexities of fully-distributed cost pricing that would of necessity supplement so called "TELRIC pricing."

# IX

# Failure to Apply the M-ECPR Will Result in a Government Taking of Private Property

The market-determined efficient component-pricing rule is not merely the proper economic prescription for the pricing of mandatory network access. It is also the rule that produces, under specific conditions described below, the level of compensation that is sufficient to avoid a taking of the incumbent LEC's property in violation of the Fifth Amendment. In this chapter, we explain the contractual and property-based protections that incumbent LECs have that require the regulator, when pricing unbundled network elements, to ensure that the LEC has the reasonable opportunity to recover all of its economic costs.

Local exchange carriers (LECs) are public utilities that assumed obligations to serve in return for the regulator's assurance that those utilities would earn a competitive return on invested capital, along with the compensation for the full cost of providing service. Regulators protect the utility's opportunity to earn a competitive return by controlling entry into its market; regulators also restrict the maximum earnings of the utility through rate setting, and they establish service requirements through universal service, carrier of last resort, and other rules. That arrangement, known as the *regulatory contract*, enabled the regulators to reconcile their ceilings on the earnings of utilities with the requirement that, in terms of actuarially expected value, prospective investors be offered a competitive rate of return on

their investments.[1] The regulator was thus said to have entered into a bargain with the public utility: In return for assuming an obligation to serve and charging not more than "just and reasonable" prices on a nondiscriminatory basis, the utility was guaranteed a franchise with regulated entry and income sufficient to recover, and to earn a competitive rate of return on, its invested capital.

When the state maintains regulatory obligations while it simultaneously eases entry restrictions, incumbent local exchange carriers encounter costly competitive disadvantages, known as "incumbent burdens."[2] Regulators typically require the LEC to provide universal service at a fixed price, regardless of the true cost of service, and to act as the carrier of last resort. In addition, regulation denies the LEC the pricing flexibility of the entrant, which places the utility at a competitive disadvantage. New entrants into regulated markets, of course, first target those customers whom regulators require the regulated incumbent to charge prices exceeding cost so that other customers may be charged prices below cost. As a consequence, when the state removes statutory barriers to entry, it will jeopardize the incumbent LEC's financial solvency unless it simultaneously allows the LEC to "rebalance" its rate structure to eliminate the implicit subsidies and unless the costs of incumbent burdens are either shared by all firms in the market or explicitly reimbursed by some third party.

In actuality, however, Congress and the state public utility commissions (PUCs) have ordered competitive entry into local telecommunications markets before having rebalanced rates and having accomplished the financing of special-service obligations more efficiently and equitably. As a result of the Telecommunications Act of 1996, every state will undertake proceedings requiring interconnection to the LEC's network and unbundled access to the LEC's basic service elements. Those proceedings are critical to the establishment of a marketplace for telecommunications services that is both competitive *and* efficient, for the setting of charges for network

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1. Another name given that arrangement is the *regulatory compact*. Because "the terms compact and contract are synonymous," Green v. Biddle, 21 U.S. (8 Wheat.) 1, 92 (1823) (Story, J.), it follows that the terms regulatory compact and regulatory contract are synonymous. A thorough discussion of the economic and legal foundation of the regulatory contract appears in J. Gregory Sidak & Daniel F. Spulber, *Deregulatory Takings and Breach of the Regulatory Contract*, 71 N.Y.U. L. REV. (forthcoming Oct. 1996).

2. The term "incumbent burdens" was introduced in Paul W. MacAvoy, Daniel F. Spulber & Bruce E. Stangle, *Is Competitive Entry Free?: Bypass and Partial Deregulation in Natural Gas Markets*, 6 YALE J. ON REG. 209, 210, 224-31 (1989).

access, if done incorrectly, has the potential to subsidize entry and penalize incumbency, or vice versa. It is easy to cheer the arrival of competition to industries where it previously has been forbidden or discouraged by law. But the predictable appeal that competition holds for legislators and regulators should not obscure the fact that the transition from regulated monopoly to competition, like the transition from dirty air to clean, is not free. Unless accompanied by other reforms, the advent of competition in local telephony will preclude the recovery, through market-determined prices, of two sets of costs: the historical costs that the LEC incurred to discharge its obligation to serve, and the future costs that incumbent burdens continue to impose on the incumbent LEC.

### A. ECONOMIC RATIONALES FOR THE REGULATORY CONTRACT

Consumers and businesses voluntarily participate in a market transaction only if they receive *gains from trade* -- that is, only if the transaction yields positive net benefits for them. A supplier will not invest in a transaction unless the supplier expects the returns from the transaction to cover all economic costs, including a competitive return to invested capital. That principle is summarized in Armen Alchian's classic definition of cost: "In economics, the cost of an event is the highest-valued opportunity necessarily forsaken."[3] The supplier's costs of investing in the transaction include the highest net benefit of all opportunities forgone, known as *opportunity cost*.

#### *1. Cost Recovery for Transaction-Specific Investment*

Cost recovery is an essential element of contract law. A contract must provide *consideration* to each of the parties, which implies that those incurring costs must expect to recover those costs including a return to invested capital.[4] Cost recovery is an essential aspect of utility

3. Armen A. Alchian, *Cost*, *in* 3 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 404, 404 (David L. Sills ed., MacMillan Co. & Free Press 1968).

4. Victor P. Goldberg, *Relational Exchange: Economics and Complex Contracts*, 23 AM. BEHAVIORAL SCIENTIST 337, 340 (1980), *reprinted in* READINGS IN CONTRACT LAW 16, 18 (Victor P. Goldberg ed., Cambridge University Press 1989).

regulation as well.[5] Utilities would not have undertaken the extensive investments required to provide regulated service within their franchise region without the opportunity to recover their costs. The regulatory contract is often justified as a means of mitigating the risks of making large irreversible investments that are faced by regulated utilities. Customers of utilities gain from such commitments, since efficient levels of investment yield lower costs of service. There is an incentive to honor commitments regarding compensatory rates of return to assure that regulated firms will undertake future investment and that they will maintain their existing capital equipment. In practice, honoring commitments to investors in regulated utilities keeps down future borrowing costs by reducing investor risk.[6]

Cost-of-service regulation of public utilities is based on allowing a utility the opportunity to recover its investment, including a competitive rate of return.[7] Utilities have had to undertake substantial investments to discharge their obligation to serve. The purpose of a regulatory contract is to provide for recovery of "economic costs," by which we mean the full cost of an activity, including direct expenditures, the time cost of money expended for capital investment, and any other opportunity costs. As mentioned earlier, an opportunity cost of an activity is the net benefit forgone from the next best alternative activity. The time cost of money is an opportunity cost of an investment because it represents the highest return that the investor could have earned by investing the money elsewhere.

The expectation that a utility will be able to recover its costs applies as well to new expenditures that the utility makes to satisfy regulatory obligations even if the industry is partially or fully deregulated. The utility cannot be asked to provide services in the competitive market at regulated prices that are noncompensatory--that is, at prices that do not allow for full cost recovery, particularly when the firm is mandated to offer unbundled services. Moreover, deregulation of the local exchange telecommunications does not eliminate the responsibilities of regulatory authorities to allow the utility the opportunity to recover costs *already incurred* to satisfy the

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5. *See* JEAN-JACQUES LAFFONT & JEAN TIROLE, A THEORY OF INCENTIVES IN PROCUREMENT AND REGULATION 53-127 (MIT Press 1993).

6. *See* DANIEL F. SPULBER, REGULATION AND MARKETS 610 (MIT Press 1989).

7. "In the absence of a detailed long-term contract, the regulated firm may refrain from investing in the fear that once the investment is in place, the regulator would pay only for variable cost and would not allow the firm to recoup its sunk cost." LAFFONT & TIROLE, *supra* note 12, at 54.

utility's obligation to serve. Regulators have a continuing responsibility to allow the utility the opportunity to recover those costs.

### 2. *Regulatory Opportunism and Asset Specificity*

The noted economist Oliver Williamson defines *opportunism* as "self-interest seeking with guile,"[8] and he describes utility regulation as a "highly incomplete form of long-term contracting" in which the terms are adapted to "changing circumstances" to assure the supplier of a fair rate of return.[9] The problem of regulatory opportunism stems from the fact that regulatory assets, including expenditures for plant and equipment and capitalized expenditures to perform duties mandated by regulators, are likely to be transaction-specific. That is, the assets have little value outside the regulatory transaction.[10]

The transition from regulation to competition being observed in markets traditionally served by public utilities is facilitated in large part by technological changes that affect the degree of asset specificity. The regulatory contract that was suited for an industry with significant asset specificity is not suited for an industry in which asset specificity has declined considerably. This problem of incompatibility between the degree of asset specificity and the regulatory regime arises in the transition to competition: Incumbent utilities have not yet recovered the costs of their assets that are specific to a regulated market, and entrants meanwhile can invest in facilities that have considerably less asset specificity (wireless telecommunications, for example) or can provide service with minimal investment (resale of incumbent telecommunications services, for example). It would breach the regulatory contract for the regulator to make unilateral changes in regulation that might prevent a utility from recovering the economic costs of investments that it made to discharge its regulatory obligations to serve. Contractual protections of the interests of the utility and its investors exist so that the state and private companies can continue to make agreements requiring investments in highly specialized capital.

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8. OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING 47 (Free Press 1985).

9. Oliver E. Williamson, *Franchise Bidding for Natural Monopolies: In General and with Respect to CATV*, 7 BELL J. ECON. 73, 91 (1976).

10. An asset's degree of specificity to be "the fraction of [the asset's] value that would be lost if it were excluded from its major use." PAUL MILGROM & JOHN ROBERTS, ECONOMICS, ORGANIZATION AND MANAGEMENT 307 (Prentice Hall 1992).

The regulatory contract depends on protections to reduce and allocate the risk of cost recovery for specialized assets that cannot be salvaged if the contract is not performed.

As with private contracts, the regulatory contract is designed to address "hold-up" problems. By incurring substantial capital expenditures to perform its obligation to serve, the utility is vulnerable to confiscation.[11] In the absence of contract enforcement, the utility is at the mercy of the regulatory authority: By lowering rates to levels that do not allow a full recovery of costs, after the facilities have been created, a regulator could take advantage of the utility and its investors. The prices posted by a company supplying telecommunications services can be raised or lowered without incurring more than the costs of communicating the new tariffs to customers. The regulated rates are thus much more flexible than are the LEC's capital facilities because the latter are irreversible, market-specific investments. To the extent that they were tailored to meet regulatory obligations to serve, the LEC's investments need not be fully recovered in a competitive market setting. That means that the regulatory contract is necessary as a means of protecting the regulated utility from regulatory "hold-up."

The opening of the local telecommunications market to competition tempts regulators to behave in an opportunistic manner. The utilities have already constructed their network facilities. They will keep those facilities in operation as long as revenues cover their operating costs, even if revenues are not sufficient to allow even partial recovery of capital costs.

"Core" customers are those customers of the LEC who have limited opportunities to switch to competitive suppliers, while "noncore" customers are better able to seek alternatives. Typically, core customers are residential and small business customers, while noncore customers are large commercial and industrial customers. Noncore customers can rely on the incumbent LEC as a backup service or carrier of last resort. Core customers thus often bear a greater share of overhead costs when deregulation leads to selective entry and bypass of the incumbent LEC. With continued regulation of the LEC's core markets, some of those costs would be shifted to

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11. For a similar argument, see Timothy J. Brennan & James Boyd, Political Economy and the Efficiency of Compensation for Takings, Resources for the Future Discussion Paper 95-28, at 25 (June 1995) ("there is the possibility of regulatory moral hazard . . . when the government can act opportunistically to capture the benefits of private investment through changes in regulatory policy").

remaining core customers while others would represent losses for utility investors. Thus, some putative benefits of competition are merely an income transfer from the LEC's investors and core customers to its noncore customers, rather than a gain due entirely to enhanced productivity. Some rate rebalancing is desirable to eliminate cross-subsidization from regulated rate structures. Deregulation should not, however, be used as a means to achieve gains for some customers by imposing losses on the LEC's investors.

### *3. Credible Commitments*

Commitments made in bargaining situations influence the behavior of other actors only to the extent that the person making such commitments is credibly bound (by himself or others) to honoring them.[12] The notion of enforceable agreements plays a similar role in regulated industries as it does in competitive markets. As Professor Pablo Spiller of the University of California has shown both theoretically and empirically, the level of investment in long-lived infrastructure undertaken by a regulated (or recently privatized) public utility depends critically on regulatory institutions having been designed to ensure the credibility of the regulator's commitments that it will not act opportunistically once the utility has placed those nonsalvageable assets into service.[13] The utility's investors would not be willing to commit vast amounts of capital to carry out an obligation to serve unless the regulator's offer of an opportunity to earn a fair rate of return were credible. Regulated utilities relied upon those contractual assurances in planning and carrying out their investment and service plans. Conversely, the regulator would not be willing to provide a monopoly franchise and to authorize the utility's pricing and investment plans unless the utility's promises to provide services were

12. *See, e.g.*, MILGROM & ROBERTS, *supra* note 17, at 131; OLIVER E. WILLIAMSON, THE MECHANISMS OF GOVERNANCE 120-44 (Oxford University Press 1996); WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM, *supra* note 15, at 167; THOMAS C. SCHELLING, THE STRATEGY OF CONFLICT (Oxford University Press 1960).

13. Pablo T. Spiller, *Institutions and Regulatory Commitment in Utilities' Privatizations*, 2 INDUS. & CORP. CHANGE 387 (1993); Brian Levy & Pablo T. Spiller, *The Institutional Foundations of Regulatory Commitment: A Comparative Analysis of Five Country Studies of Telecommunications Regulation*, 10 J.L. ECON. & ORG. 201 (1994); Shane Greenstein, Susan McMaster & Pablo T. Spiller, *The Effect of Incentive Regulation on Infrastructure Modernization: Local Exchange Companies' Deployment of Digital Technology*, 4 J. ECON. & MGMT. STRATEGY 187 (1995).

credible. The legal and public policy context in which the regulatory process operates provides guarantees to the parties to the regulatory contract.

As with private contracts, the regulatory contract must involve consideration, for the agreement is voluntary. The regulated utility submits to various regulatory restrictions including price regulations, quality-of-service requirements, and common carrier regulations. In return, the regulated firm receives a franchise subject to entry regulation in its service territory and its investors are allowed an opportunity to earn revenues subject to a rate-of-return constraint. Without the expectation of earning a competitive rate of return, investors would not be willing to commit funds for the establishment and operation of the utility. The funds are committed to provide services to the customers of the regulated utility. Once the utility invests those funds, the long depreciation schedules typical in electricity and telecommunications regulation credibly commit the utility to performing its obligations under the regulatory contract by denying it the opportunity to recover its capital before the end of its useful life.

### *4. Relational Contracting*

A question sometimes asked in regulatory proceedings is, "Where, Professor *X*, is this regulatory contract to which your testimony refers?" The regulatory contract is recorded in a bundle of documents: public utility statutes, utility commission precedents, adjudicatory decisions, rulemakings, hearings on the record, formal notices of proposed rulemaking, and public commentary. Such reasoning is neither novel nor inherently economic, for it is the same logic that propels the Supreme Court's analysis of state legislation that has given rise to a contractual obligation.[14] Although the original franchise agreement between the public utility and a municipality is usually the critical first document in the bundle of agreements concerning the relationship between the state and the utility, no single document is likely to encapsulate the entire regulatory contract. The relational contract between the utility and the regulated firm is analogous to a

14. "In general, a statute is itself treated as a contract when the language and circumstances evince a legislative intent to create private rights of a contractual nature enforceable against the State. In addition, statutes governing the interpretation and enforcement of contracts may be regarded as forming part of the obligation of contracts made under their aegis." United States Trust Co. v. New Jersey, 431 U.S. 1, 17 n.14 (1977).

corporation, which is an easily identified entity but consists of multiple contracts that define the firm. The corporation is often said to be a "nexus of contracts" between the firm and its investors, employees, suppliers, and customers.[15] Although there may be articles of incorporation, the contracts that compose the firm are not be unified in a single document.

Professor Victor Goldberg of Columbia Law School provides an important early characterization of the regulatory contract. He observes that private contracts involve both an *ongoing relationship* that uses "rough formulae or mutual agreement to adjust the contract to current situations," and *agency*, which occurs when a firm deals with many customers who "find it desirable to act collectively through an agent both to negotiate the terms and to administer the contract over time."[16] Goldberg asserts that "regulation can be viewed as an implicit administered contract in which both elements are significant."[17]

Even if there were no explicit documentation at all of the relationship between the regulator and the firm, the regulatory contract would still represent an unambiguous meeting of the minds. As with private contracts, the regulatory contract has both express and implied provisions. The franchise award, orders approving rates, and orders approving capital expenditures are clearly formal written agreements. Inclusion of capital expenditures in the regulated rate base is certainly a formal contractual agreement. The regulatory contract also has implied features. The utility undertakes capital expenditures of some extended economic lifetime in anticipation of cost recovery. Regulatory approval of such capital expenditures implies that there will not be fundamental changes in the regulator's approach to the company's market environment during the economic lifetime of those investments without addressing the issue of compensating investors.

Through the regulatory process, parties present testimony and evidence in formal public proceedings for the record. The agency gives formal notice of proposed rulemakings and considers the comments of interested parties. That process establishes the regulatory bargain and serves not only to make the process transparent, but also to assure the participants that their interests are protected, just as contract rights and

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15. *E.g.*, FRANK H. EASTERBROOK & DANIEL R. FISCHEL, THE ECONOMIC STRUCTURE OF CORPORATE LAW 8-12 (Harvard University Press 1991); ROBERTA ROMANO, THE GENIUS OF AMERICAN CORPORATE LAW (AEI Press 1993).

16. Victor P. Goldberg, *Regulation and Administered Contracts*, 7 BELL J. ECON. 426, 428, 429 (1976).

17. *Id.* at 427.

remedies protect the parties to private contracts. The formal proceedings make a public record that helps to protect the legal and economic interests of consumers and the firm's investors.

### B. THE PRINCIPAL COMPONENTS OF THE REGULATORY CONTRACT

The three components of the regulatory contract are entry controls, rate regulation, and utility service obligations.[18] The state commission controls the entry of the utility's competitors and authorizes rates that give the utility's investors the opportunity to earn a "fair" rate of return on their investment. In return, the regulated utility must comply with regulatory accounting procedures for the disclosure of its costs, abide by price regulations, limit its business activities in other markets, invest in sufficient transmission and access services to all customers within its service territory who request service, operate efficiently as determined by the regulatory commission, make only investments that are "prudent," meet regulatory standards for quality of service, and comply with a host of other provisions.

The broad terms of the regulatory contract are governed by the regulatory authority's preceding decisions, legislation, and judicial oversight. Regulated rates are set through public rate hearings that follow rules of administrative procedure. The regulatory authority approves the utility's investment projects through prudency reviews and used-and-useful hearings. The regulators approve the prices charged by the regulated utility and review its financial performance. Thus, the regulatory contract is between the utility and the regulatory commission, as the agent of the legislature, which in turn represents the general public.

### C. REMEDIES FOR BREACH OF THE REGULATORY CONTRACT

Contract remedies provide guidance on the measurement of stranded costs and the proper economic approach to determining compensation for those costs. Given that the LEC's costs were incurred under the regulatory contract, the opening of the LEC's market to competition--that is, the termination of the exclusivity of the utility's franchise--is a breach of a material term of that contract if not accompanied by a

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18. A detailed analysis of these elements of the regulatory contract appears in Sidak & Spulber, *supra* note 1.

corresponding removal of incumbent burdens. Unilateral opening of the market to competition is opportunistic behavior by the promisor--namely, the regulator.

In private contracts, damage remedies for breach guard against opportunistic behavior. The standard remedy for breach of contract is to award the promisee its *expectation interest.*[19] The proper remedy for breach of the regulatory contract is therefore to give the LEC the expected level of profit that it would have received had there not been a breach of the regulatory contract. The contract price under the regulatory contract equals the sum of the LEC's revenue requirements over the years that the regulatory contract was expected to remain in force. As noted previously, the revenue requirement equals the utility's operating cost (plus depreciation), plus its allowed rate of return multiplied by its rate base. The LEC's variable cost equals its operating cost plus depreciation.

### *1. The LEC's Right to Expectation Damages for the Regulator's Breach of the Regulatory Contract*

The expectation damage remedy for breach of the regulatory contract can be calculated based on principles of contract law. It is useful to specify the method of determining those damages in the context of regulation.

Consider the simplest case of a two-period investment problem. In the initial period, the LEC makes an irreversible investment of $I$ dollars in plant and equipment. The LEC expects to earn revenues $R^e$ and to incur operating costs $C^e$ in the second period. The LEC discounts its earnings at rate $i$, which represents the opportunity cost of capital in an investment of comparable risk. The expected profit of the LEC is therefore equal to discounted expected revenues net of operating costs minus capital investment:

$$\frac{R^e - C^e}{1+i} - I$$

19. E. Allan Farnsworth, *Legal Remedies for Breach of Contract*, 70 COLUM. L. REV. 1145 (1970); Lon Fuller & William Perdue, *The Reliance Interest in Contract Damages*, 46 YALE L.J. 52 (1936); *see also* DAN B. DOBBS, REMEDIES: DAMAGES, EQUITY, RESTITUTION 786-88 (West Publishing Co. 1973).

The profit is also referred to as *economic rent*. The net revenues $R$ - $C$ are referred to as *quasi-rent*.

Economic rent provides an incentive for a firm to enter the market. That means that the contract must be such that expected profit is greater than or equal to zero. The LEC would not make an investment unless the present discounted value of net revenues exceeds investment cost.

Economic quasi-rent provides an incentive for a firm not to exit the market. Once the firm has sunk its irreversible investment $I$, the firm no longer considers the investment in its decision making. It decides whether or not to produce depending on whether expected revenues cover expected costs, $R^e \geq C^e$. That is precisely the temptation for the other party to the contract to behave opportunistically. The regulator has an incentive at that point, after the investment has been made, to seek to lower revenue payments to the level of expected costs. The LEC would continue to operate even if revenues were lowered all the way to the level of expected costs. Thus, regulatory opportunism is an attempt to capture the LEC's quasi-rent.

Suppose that the regulator breaches the contract after the LEC has made the irreversible investment in plant and equipment. If the LEC does not operate, it does not receive revenues $R$, but it also does not incur operating cost $C$. Thus, expectation damages for breach of contract equal the net revenues forgone:

$$\textit{Expectation damage payment} = R^e - C^e.$$

Thus, expectation damages equal the firm's expected net earnings and correspond exactly to the firm's quasi-rent. If the expectation damage payment is made, then the LEC earns the profit that it would have made had the contract been honored. Moreover, the regulator is not tempted to breach the contract simply to capture the quasi-rent, because that would be the precise amount of the damage payment.

$$PDV = \sum_{t=0}^{T} \frac{R_t^e - C_t^e}{(1+i)^t}.$$

In the *PDV* calculation, the terms $R_t^e$ and $C_t^e$ denote expected revenues and operating costs in period *t*, and *i* is the discount rate.

### 2. *Competition and Mitigation of Damages*

If the LEC's productive assets are removed from service as a result of competitive rules and continuing regulation, then its stranded cost is a loss to society. As in the case of any loss of resources, steps to mitigate the loss should be taken by parties in a position to do so.[20] The common law is replete with instances where a party legally entitled to compensation for a harm it has suffered nonetheless is obliged to mitigate that harm if possible.[21] Not surprisingly, state PUCs have addressed the recovery of "nonmitigable" stranded costs, a concept whose meaning we shall now explore.

#### a. *The LEC's Duty to Mitigate and the Regulator's Duty Not to Impede Mitigation*

Though it is clear that the LEC's duty to mitigate stranded costs serves the interest consumers, it is also clear on closer inspection that mitigation serves the LEC's best interest as well. That is so because the LEC's large business customers do not have service contracts that terminate simultaneously. As customers with early expiration dates depart, they leave the as-yet-unrecovered portion of stranded costs to be borne by a dwindling number of remaining customers. But the overwhelming number of those remaining (commercial and industrial) customers can be presumed to operate in competitive markets for their own goods and services. A firm in a competitive market that is made to pay a higher price than its rivals for an essential input such as telecommunications will suffer losses and, in the extreme case, eventually cease operations. Companies that cease operations do not buy any telecommunications services from the LEC, even if they remain contractually obligated to do so.

Knowing that it cannot bankrupt or financially jeopardize its remaining customers in that manner, the LEC has a strong incentive to

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20. The following discussion expands that found in WILLIAM J. BAUMOL & J. GREGORY SIDAK, TRANSMISSION PRICING AND STRANDED COSTS IN THE ELECTRIC POWER INDUSTRY 111-13 (AEI Press 1995).

21. *E.g.*, Sauer *v.* McClintic-Marshall Construction Co., 179 Mich. 618, 146 N.W. 422 (1914); RESTATEMENT (SECOND) OF CONTRACTS § 350 comment b.

find new customers for its excess capacity. The obligation illustrates that the economic interests of the utility and consumers are indeed often entirely compatible, despite appearances to the contrary.

Those losses are offset by revenues that the LEC will earn in the marketplace *using those same facilities*. As in the preceding example, the expectations damages that would restore the LEC to the position that it would have occupied had the regulatory contract not been breached equal the LEC's revenue requirement net of competitive market revenues. *Therefore, the proper economic measure of stranded costs equals the difference between (1) the LEC's net revenue requirement under regulation and franchise exclusivity and (2) the net revenues earned by the LEC from those stranded facilities in the competitive market.*

It is important not to deduct all of the LEC's potential earnings in the competitive market, for they may include earnings from newly expanded facilities that would have been obtained even if the regulatory contract had continued in force. Only those revenues earned from facilities that were released by the termination of the regulatory contract should be used to offset the losses.

Some harm is nonmitigable. "Regulatory assets," such as deferred rate increases, generally have no market value because they are no more than accounting conventions. Common sense and economic efficiency dictate that the regulator not perpetuate policies that continue to increase the magnitude of such regulatory assets at the same time that the regulator is contemplating remedies for breach of the regulatory contract. Even if the regulator takes steps on its own to mitigate the stranding of regulatory assets, it will still be difficult for the LEC to mitigate damages resulting from its inability to recover the cost of facilities that deregulation has made obsolete. It may be the case that *no* form of mitigation is available to the LEC other than to do what competition would require--namely, to retire facilities whose revenues fail to cover operating costs.

Furthermore, the regulator has a duty not to interfere with the LEC's efforts to mitigate stranded costs. Mitigation requires the LEC to make the best use of capital facilities created under regulation. It is therefore essential that the regulator not restrict the incumbent LEC's pricing and product offerings in the new competitive environment. The regulator's imposition or continuation of pricing restrictions and quarantines can only increase the magnitude of the LEC's nonmitigable stranded costs, which ultimately will harm consumers.

### b. *The Measurement of the LEC's Expectation Damages Net of Mitigation*

Expectation damages emphasize the public utility's forgone earnings as a consequence of the regulator's breach of the regulatory contract. One should therefore compute the value of stranded assets by calculating the LEC's expected net revenue stream under regulation and subtracting the LEC's expected net revenue stream under competition.

The regulator breaches the regulatory contract by opening the market to competition without issues of stranded costs and incumbent burdens. The utility is likely to continue operating. It may experience lower revenues, but its costs may change as well. Let $R_1$ and $C_1$ denote expected revenues and costs under regulation, and let $R_2$ and $C_2$ denote expected revenues and costs under competition. Then, the fundamental measure of the change in the firm's net expected earnings is defined as:

$$\Delta \equiv (R_1^e - C_1^e) - (R_2^e - C_2^e).$$

The expectation damages for a given period equal the difference between the contract price net of regulated costs and the market price net of competitive market costs:

$$\textit{Expectation damages} = \Delta .$$

The net revenues in the competitive market, $R_2^e$ - $C_2^e$, are the *mitigation* of contract damages. If the LEC earns this amount and receives the damages payment, that is sufficient to restore the seller's expected profit. The expectation damage payment assumes that the payment is made at the time that the net revenues would have been incurred.

Measurement of expectation damages is further complicated because the assets of the deregulated LEC have long lives. Let $PDV_1$ denote the present discounted value of expected net revenues under regulation as previously defined. Similarly, define $PDV_2$ as the present discounted value of expected net revenues earned by the firm under competition. The economically correct measure of damages net of mitigation is to take the difference between the present discounted values of the two cash flows:

$$\textit{Expectation damages} = \Delta^* \equiv PDV_1 - PDV_2.$$

When there is only a single period, that expression coincides with the single- period expectation damage measure. When there is more than one period, the calculation of damages encounters at least two difficulties. First, the time horizons for the two *PDV* calculations can easily differ. For example, the assets may be retired from service much sooner in the competitive case than they would be in a regulated industry. So there are two distinct time horizons, $T_1$ under regulation and $T_2$ under competition. Second, the discount rates will most likely differ in the two *PDV* calculations. For example, increased risk in the competitive market will require a higher rate of discount in the competitive *PDV*. Therefore, there are two discount rates, $i_1$ under regulation and $i_2$ under competition. Because the competitive firm expects to earn $PDV_2$ under competition, it follows that the expectation damage payment (possibly with different time horizons and discount rates for the two *PDV* calculations) restores the expectation of the firm to its initial expectation, which is $PDV_1$.

### D. CONTRACT MODIFICATION: THE REPLACEMENT OF RATE-OF-RETURN REGULATION WITH INCENTIVE REGULATION

Parties to a contract sometimes modify their agreement and thus supersede the old contract with a new one. With respect to the regulatory contract, modification has occurred when the regulator and the LEC have agreed, through the formality of public rulemakings, to alter a key provision of the contract, such as the manner in which the price of the LEC's output is determined and whether the LEC's profit level will be regulated along with its price. That modification has taken the form of the transition from cost-of-service, rate-of-return regulation to incentive regulation such as price caps.[22] State legislatures have also participated in some modifications of the regulatory contract by repealing statutes that prohibit competitive entry into regulated services such as local exchange telephony.[23]

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22. *See* DAVID E.M. SAPPINGTON & DENNIS L. WEISMAN, DESIGNING INCENTIVE REGULATION FOR THE TELECOMMUNICATIONS INDUSTRY (MIT Press & AEI Press 1996).

23. *E.g.*, CAL. PUB. UTIL. CODE § 2882.3; VA. CODE § 56-235.5.

Some of the new regulatory structures even carry the name "social contract."

Changes in regulatory procedures, such as a switch from rate-of-return regulation to a system of price caps does not necessarily represent a termination of the regulatory contract. Generally, such changes in telecommunications regulation have preserved the regulator's obligation to provide the LEC with an opportunity to earn a competitive rate of return on its investment.

The basic system of price caps often keeps in place other aspects of rate regulation. The regulator continues to control rates through the caps; the LEC has price flexibility below the price limit. Price-cap formulas frequently feature sharing rules that require the LEC to divide earnings above some threshold amount with its customers. Regulators typically continue to assume responsibility for the LEC's financial health. The basic dimensions of the regulatory contract remain in place if regulators retain the system of entry controls as revenue protection devices and maintain the LEC's service obligations. Thus, the switch to incentive regulation, while maintaining other components of the regulatory contract, represents at most modification, not abandonment, of the contract.

Changes in the mechanism of rate adjustment are an administrative procedure instead of a fundamental change in contract terms. Price-cap mechanisms provide incentives for efficiency by allowing utilities to keep some of the gains from cost reductions. Such benefits existed under rate-of-return regulation as a consequence of lags between rate hearings. Price caps confers pricing flexibility allowing the LEC to carry out some limited changes its rate structure, while keeping regulatory control over total revenues. Incentive regulation begins to constitute a fundamental renegotiation of the regulatory contract only when it is coupled with relaxation of entry controls and changes in the LEC's obligations to serve.

The use of price caps and other forms of incentive regulation does not alter the manner in which damages for breach of the regulatory contract are calculated. The damages should still equal the present value of net revenues. The amount of damages should be adjusted to the extent that the pricing method alters the net revenue expectations of the LEC. The relaxation of entry barriers reduces earnings, and competitive opportunities allow for mitigation as before. The formula for calculating damages thus remains the same.

### E. MISTAKE AND IMPOSSIBILITY

When, in private contracts, an unforeseen event makes the performance of a contract substantially more costly for one of the parties than at the time the parties entered into their agreement, the party facing that higher cost of performance may argue that he should be excused from performing the contract because it is impossible to do so.[24] Similarly, one party in those circumstances may seek to be excused from performance on the grounds that no contract in fact exists because of the (presumably mutual) mistake of the promisor and promisee. One would similarly expect regulators to claim mistake or impossibility as a defense to efforts by the LEC to enforce the regulatory contract. It was a mutual mistake of fact, the state would assert, not to foresee that a competitive market structure could arise in the relevant network industry. Similarly, the advent of a competitive market, the state would argue, makes it impossible for it to ensure that the LEC can recover its invested capital and earn a competitive rate of return on it.

Before we examine the plausibility of such arguments, its bears emphasis that by their very nature such defenses raised by the regulator reinforce the conclusion that the LEC and the state entered into a contract. The thrust of those defenses is that the formation of the regulatory contract was faulty because of mutual mistake, or that forces beyond its control prevent the regulator's performance of that contract at a cost that the parties would have considered reasonable ex ante. In either case, the regulator's defense forecloses the argument that it never had a contractual relationship with the LEC. Furthermore, whenever a party invokes the defense of impossibility or mistake, the natural question to ask is whether the parties already contracted, implicitly if not explicitly, for the risk in question to be borne by the party now seeking to have the contract declared void. In the case of a LEC, that question is especially compelling, for a critical objective of the regulatory contract is to reduce the volatility surrounding the allowed rate of return so that the LEC can efficiently use debt to fund its investments in transaction-specific, long-lived investments in infrastructure.

Consider now the remedy if the regulatory contract were declared void and service were terminated. When, because of mistake or impossibility, a contract is rescinded or deemed never to have been formed in the first place, the court orders the parties to make

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24. *See* Richard A. Posner & Andrew M. Rosenfield, *Impossibility and Related Doctrines in Contract Law: An Economic Analysis*, 6 J. LEGAL STUD. 83 (1977).

restitution of the benefits conferred upon one another.[25] That remedy is intended to prevent the parties from being unjustly enriched at the expense of the other or unjustly penalized. The parties are to be restored to the position that they would have occupied had the contract not been signed. That exercise presents difficulties, for there are costs incurred from the transaction --namely, the investment of the LEC, which cannot be reversed.

For the LEC, restitution of the benefits that it conferred upon the state (for consumers, as third-party beneficiaries) suggests a damage remedy similar to recovery of reliance expenditures. Because the LEC is subject to cost-of-service regulation, the LEC's expected revenues were meant to recover the economic costs of providing service. Thus, the LEC was expected to be allowed to recover the cost of its investment and a competitive rate of return. To the extent that the LEC did not recover some portion of its costs under the agreement, it should be allowed to recover the remaining amount from consumers.

A court should offset such recovery by deducting any benefits that the LEC received up until the moment of rescission. That offset would include the maximum of the scrap value of the capital investment or the returns that could be obtained from continued operation of the facilities to provide service in the competitive market. By deducting the returns from continued use of the facilities, the LEC would not benefit from the continued services of facilities, from continued use of public rights of way (presumably at incremental cost), or from facilities constructed using eminent domain. The past benefits of franchise exclusivity need not be reimbursed because regulation already constrained the LEC's revenues. In the unbundling of the local telecommunications network, the regulator has already taken the benefit of entry regulation away from the incumbent LEC.

Up until the moment of rescission, what benefits have consumers received from the LEC? During each preceding year that a regulatory contract was thought to be in effect, consumers compensated the LEC under cost-of-service regulation for the value of service delivered. The services consumed cannot be returned, and reasonable payment has already been made. Thus, the remaining compensation that need be made by consumers in this case is the LEC's rate base plus a fair rate of return to capital investment. The depreciation schedule required by the regulator meant that consumers received service at a price that paid for the retirement of a lesser

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25. RESTATEMENT OF CONTRACTS § 468 (1932); RESTATEMENT OF RESTITUTION § 150 (1939); DOBBS, *supra* note 35, at 266, 722, 741, 974.

amount of the LEC's invested capital than was realistic in light of the economic obsolescence of assets precipitated by newer, more efficient technologies. Similarly, consumers received the benefits of all the incumbent burdens, discussed at length earlier, that were borne by the LEC between the outset of the contract and the time of its being set aside.

The question is, Who is responsible for preventing mistakes? The efficient solution to that question is to place the responsibility for preventing mistakes on the party who can do so at the least cost. The LEC has a responsibility to present accurate data of cost and performance of its service obligations to the regulatory authority. Those responsibilities already are reflected in disclosure requirements. The regulator has a responsibility to make clear its own regulatory policy, in terms of what types of investment are approved for inclusion in the rate base, what prices the LEC may charge, and what the LEC's service obligations are. The regulatory authority surely is the party best informed about impending changes in its own policies, particularly with regard to substantial deregulation. The regulator has a professional staff and operates a system of public hearings on the record. It should not be able to sustain a defense that it did not understand the terms of the regulatory contract.

## F. DEREGULATORY TAKINGS

The Takings Clause of the Fifth Amendment states: "Nor shall private property be taken for public use, without just compensation."[26] Even if one refuses to recognize that the regulatory contract is enforceable as a matter of contract law against the regulator in the event of its breach, the abnegation of that relationship between the regulator and the LEC (whatever legal name one chooses to attach to it) effects a taking of private property for public use--namely, the promotion of competition in a regulated industry--without just compensation. We call that form of confiscation of private property a *deregulatory taking*.

Sweeping deregulation promises to bring the benefits of competition to local telecommunications markets. Those benefits include improvements in operating efficiencies, competitive prices, efficient investment decisions, technological innovation, and product variety. The benefits of competition, however, do not include forced transfers of income from shareholders of LECs to their customers and competitors as a result of asymmetries in regulation. Asymmetric regulation can only serve to impede competition and impair the financial health of incumbent LECs. As regulators dismantle barriers to entry and other regulatory restrictions, they must honor their past commitments and avoid actions that threaten to confiscate or destroy the property of utility investors on an unprecedented scale.

The Supreme Court has placed takings cases into three categories.[27] In declining order of judicial solicitude given the property owner, the categories are physical invasions of property; confiscatory public utility rates; and regulatory takings. Breach of the regulatory contract does not fit automatically into any one of those categories because, being unprecedented, it necessarily is a case of first impression under the Takings Clause. That is true even with respect to the precedents addressing public utility regulation. Respectable arguments can be made for and against recovery of stranded costs, but ultimately the Court will have to rely on first principles of legal and economic theory to decide whether to recognize a deregulatory taking

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26. U.S. CONST. amend. V.

27. We confine our analysis to the Takings Clause of the U.S. Constitution. Analogous provisions in the state constitutions, some of which predate the Fifth Amendment, may offer even stronger protections against uncompensated confiscations of property. *See, e.g.*, Burrow v. City of Keene, 122 N.H. 590, 596 (1981) ("the New Hampshire Constitution makes explicit what is implicit in the Fifth Amendment to the Federal Constitution, namely, that no *part* of a man's property shall be taken from him . . . without his consent") (emphasis in original).

as an event necessitating the state's payment of just compensation. Close examination of the Court's reasoning supports the conclusion that, under all three branches of existing takings jurisprudence, the regulator's abrogation of the regulatory contract would be a compensable confiscation of the property of the regulated firm. That result holds whether one casts a deregulatory taking as a physical invasion of property, as a confiscatory setting of public utility rates, or as a noninvasive regulatory taking.

### G. JUST COMPENSATION FOR TAKINGS

At what magnitude is the compensation paid for a taking of private property "just"? *Compensation for involuntary exchange is just when it is equivalent to the compensation that could be derived from voluntary exchange.* Another way of stating the proposition is that the property owner is treated justly when he is made to be indifferent between voluntarily selling his asset in the market and submitting to the state's power of eminent domain to condemn his asset for public use.[28] That economic reasoning corresponds to the general principle in both American constitutional law[29] and English common law for determining fair compensation for a taking.[30]

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28. *See* RICHARD A. EPSTEIN, TAKINGS: PRIVATE PROPERTY AND THE POWER OF EMINENT DOMAIN 182 (Harvard University Press 1985) ("In principle, the ideal solution is to leave the individual owner in a position of indifference between the taking by the government and retention of the property.").

29. *E.g.*, Olson *v.* United States, 292 U.S. 246, 255 (1934). The Court has also repeatedly stated: "The owner is to be put in the same position monetarily as he would have occupied if his property had not been taken." United States *v.* Reynolds, 397 U.S. 14, 16 (1970). *Accord,* United States *v.* New River Collieries Co., 262 U.S. 341, 343 (1922); Seaboard Air Lines R. Co. *v.* United States, 261 U.S. 299, 304 (1922). That formulation of compensation should not be confused with reliance damages: If the property owner were restored to the *status quo ante*, he could voluntarily transfer his property to a willing buyer at its expectation value. Thus, the Court's formulation implicitly requires that restoration of the property owner to the *status quo ante* will compensate him for all the opportunity costs of losing his property to government confiscation.

30. "The purpose of compensation is that it gives to the owner compelled to sell the right to be put as far as money can do it, in the same position as if his land had not been taken from him." 8 HALSBURY'S LAWS OF ENGLAND ¶ 250 (4th ed.); *see also* Nelungaloo Pty. Ltd. *v.* Commonwealth, 75 C.L.R. 495, 571 (High Court 1948) ("[T]he purpose of compensation . . . . is to place in the hands of the owner expropriated the full money equivalent of the thing of which he has been deprived.").

What, then, is the price that the property owner would demand before he would voluntarily part with his asset? Another way of phrasing the question is to ask what would be the full cost to the property owner of parting with the asset. The critical insight to answering that question comes from Armen Alchian's definition that "the cost of an event is the highest-valued opportunity necessarily forsaken."[31] The property owner, therefore, would demand the asset's opportunity cost. English common law contains a corresponding expression of that economic reasoning: The property taken is to be valued not merely by reference to the use to which it is being put at the time, but the owner is also entitled to compensation for the potentialities or possibilities of development--that is, the property's opportunity cost.[32] American courts have similarly ruled that the property owner is entitled to compensation for the property's "most profitable purpose, or advantageous use."[33]

A deregulatory taking deprives shareholders of the expected returns associated with entry controls and pricing regulations, as well as the intended use of the regulated property, that existed before the deregulation. Thus, it is not necessary to determine the purchase costs of the regulatory assets, nor their resale value, nor their replacement costs. The utility placed the assets in service in expectation of the earnings that would be received. The expected returns of the firm constitute *investment-backed expectations.*

Therefore, just compensation for a deregulatory taking should equal the change in the expected returns to the owners of the property. In the basic example of single-period returns, with compensation paid in the current period, just compensation is the difference between the expected net returns under regulation and the expected net returns under competition deriving from the property:

$$\textit{Just compensation} = \Delta .$$

If the property is expected to generate returns over multiple periods, those returns should be discounted at the appropriate rate, so that compensation equals the difference between the present discounted value of net earnings expected under regulation and those expected

31. Armen A. Alchian, *Cost, in* 3 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 404, 404 (David L. Sills ed., MacMillan Co. & Free Press 1968).

32. Robinson Bros. (Brewers) Ltd. *v.* Houghton & Chester Lee Street Assessment Committee, 2 K.B. 445 (1937), *aff'd*, A.C. 321 (1938) (House of Lords).

33. *E.g.*, Emmons *v.* Power Utils. Co., 83 N.H. 181, 184 (1927).

under competition. To make the investors whole, they should be compensated for the change in the value of the firm:

$$\textit{Just compensation} = \Delta^{*}.$$

Therefore, for the one period or the multiperiod case, just compensation for a deregulatory taking exactly equals damages for breach of contract.

Another way to determine the change in investment-backed expectations is to consider the change in the value of the firm to the shareholders as a consequence of deregulation. The value of the firm is the sum of each year's discounted cash flows net of investment requirements.[34] Thus, in the absence of additional investment in the firm, the value of the firm is the present discounted value of expected earnings:

$$V = \sum_{i=0}^{T} \frac{(R_t^e - C_t^e)}{(1+i)^t}$$

The firm has a different value under regulation than it does under competition. Let $V_1$ and $V_2$ respectively denote the value of the firm calculated for net revenues under regulation and the value of the firm calculated using expected net revenues under competition. Then, it should be apparent that the change in the value of the firm is the difference between the two present discounted values of cash flows:

$$V_1 - V_2 = \Delta^{*}.$$

Thus, just compensation for a deregulatory taking from investors is equal to the change in the value of the firm.

34. *See, e.g.*, J. FRED WESTON, KWANG S. CHUNG & SUSAN E. HOAG, MERGERS, RESTRUCTURING AND CORPORATE CONTROL (Prentice Hall 1990).

## H. THE NEED TO SUPPLEMENT THE EFFICIENT COMPONENT-PRICING RULE WITH A COMPETITIVELY NEUTRAL END-USER CHARGE TO ENSURE JUST COMPENSATION

Access pricing that promotes only *efficient* entry, interconnection, and bypass in the market at issue also serves to compensate the utility for its opportunity cost. Thus, if the access pricing rule is calculated properly, and if there is no competition in the provision of access, then the rule will serve the same function as contract damages or just compensation. Therefore, under the efficient component-pricing rule, interconnection prices are not confiscatory under the Takings Clause. We will demonstrate first why that result obtains and then show how the M-ECPR will *fail* to provide just compensation if there is competition in the provision of any element of network access. In the presence of such competition, just compensation requires that the incumbent LEC receive an end-user charge equal to the residual amount of unrecovered costs that remain after the incumbent LEC has priced access to each network element at the *lower* of the M-ECPR price *or* the stand-alone cost of providing that element. In the face of competitive provision of network access or network elements, even a price set according to the M-ECPR will constitute a taking unless it is accompanied by an end-user charge of the magnitude just described.

### *1. Just Compensation in the Absence of Competition for Network Access*

The efficient component-pricing rule recovers the utility's opportunity cost of entry D in each period. By applying the M-ECPR over time, the utility recovers the net present value of expected revenues. In each period, the utility's net earnings from selling its final output plus the net earnings from selling access equal the net earnings it expected to have obtained under regulation,

$$(R_2 - C_2) + \Delta = R_1^e - C_1^e.$$

Thus, the present value of the utility's total net earnings is equal to the present value of the earnings that it expected under regulation, $PDV_1$. Applying the M-ECPR in each period to recover opportunity costs thus is equivalent to a one-time payment of $\Delta^*$ in the initial period.

If the regulator imposes an access pricing rule that fails to compensate the utility for the opportunity costs of the resources used to provide unbundled access, then the regulator will have given the utility less compensation for that involuntary exchange than that to which the utility would be entitled under established takings jurisprudence. Moreover, the relevant opportunity cost subject to full compensation will not be a static one, but rather a dynamic one that takes into consideration, in the case of a local exchange carrier, the profits that the utility will forgo from lost sales of interactive narrowband, interactive broadband, and enhanced services supported by the advanced information network. In short, if the regulator orders the utility to provide unbundled access to its basic service elements at a price less than that implied by the efficient component-pricing rule, the regulator will effect an uncompensated taking of the utility's property.

*Duquesne* supports that jurisprudential proposition. There the Court said that decisions regarding the rates of return for regulated utilities "should be commensurate with returns on investments in other enterprises having corresponding risks" and should not "jeopardize the financial integrity of the companies . . . by impeding their ability to raise future capital."[35] If the regulator were to require the utility to sell unbundled access to its basic service elements at a price that did not include the utility's full opportunity cost, the utility's shareholders would suffer a corresponding forfeiture in their share price. That forfeiture in turn would cause future investors to demand a risk premium from the utility--which is to say that the company would face a higher cost of capital that reflected the risk that the regulator might unexpectedly take future actions, contrary to the regulatory contract, that would arbitrarily expropriate shareholder wealth.

### 2. *Just Compensation in the Presence of Substitutes for Network Access*

One significant caveat must be added to the preceding claim that an equivalence exists between just compensation and the price for mandatory network access computed according to the efficient component-pricing rule. The M-ECPR is compensatory in the sense that it covers the incumbent utility's direct economic costs and opportunity costs. The M-ECPR, however, is not fully compensatory in certain circumstances.

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35. 488 U.S. at 312, 314.

The presence of facilities-based entry into the provision of the bottleneck technology, and the possibility that entrants may purchase, under existing retail rates, services that are substitutes for the unbundled network elements of the incumbent utility, reduce the likelihood that the utility will recover its total costs. The M-ECPR may indicate that the incumbent utility should charge a price for network access that exceeds the stand-alone cost of a rival technology for the provision of access (such as wireless loops, or the self-provision of switches). In that case, the market will allow the incumbent to charge at most a price for access that equals the stand-alone cost of the rival access technology. The residual that remains to be recovered to meet the utility's total costs must be collected by an alternative method, such as a competitively neutral, nonbypassable end-user charge.

#### 3. *What Costs Does the End-User Charge Recover?*

The end-user charge recovers four categories of cost burdens that the incumbent LEC cannot recover through competitive prices but has incurred to discharge its obligation to serve: (1) shared costs of network operation, incurred among two or more (but not all) of the incumbent LEC's services, but not wholly attributable to any single service; (2) common costs of network operation, incurred among all of the incumbent LEC's services; (3) losses incurred in providing services to customers at regulated prices that are below the incremental cost of providing such service; and (4) costs incurred as a result of incumbent burdens that the incumbent LEC continues to bear after the advent of competition, but which entrants are not required to bear. The end-user charge would *not* recover monopoly rents or cost inefficiency.

## I. *NORTHERN PACIFIC RAILWAY* AND THE REGULATOR'S REDEFINITION OF THE INTENDED USE OF DEDICATED PROPERTY

The Supreme Court's 1915 decision in *Northern Pacific Railway Co.* v. *North Dakota* has great relevance to the mandatory unbundling of network access now occurring in local telephony, for the decision emphasizes that private property that a regulated utility has dedicated to a public purpose cannot be appropriated by the government for a

different purpose.[36] The case involved a challenge by two railroad companies to a North Dakota statute setting maximum rates on the intrastate carriage of coal. The railroads claimed that the rates forced them to carry coal at a loss or at an uncompensatory rate (taking into account a competitive return to capital) and therefore constituted a taking of private property. Although the North Dakota Supreme Court agreed that the rates forced the companies to carry coal at a uncompensatory rate, it nonetheless deemed those rates not to be confiscatory because the companies overall continued to earn a reasonable return on their intrastate business.

The Supreme Court reversed It held that the statute was an attempt to take a carrier's property without due process of law in violation of the Fourteenth Amendment. Although the state enjoys broad power to regulate private property devoted to a public use, Justice Hughes, writing for the eight-member majority, stressed that, "the State does not enjoy the freedom of an owner."[37] That the state may reasonably regulate to ensure that a carrier fairly discharges the obligations of its charter does not mean that state may redefine the public use to which the carrier's property is dedicated, even if the carrier's total business continues to earn a sufficient return:

> The fact that the property is devoted to a public use on certain terms does not justify the requirement that it shall be devoted to other public purposes, or to the same use on other terms, or the imposition of restrictions that are not reasonably concerned with the proper conduct of the business according to the undertaking which the carrier has expressly or impliedly assumed . . . . The public interest cannot be invoked as a justification for demands which pass the limits of reasonable protection and seek to impose upon the carrier and its property burdens that are not incident to its engagement. In such a case, it would be no answer to say that the carrier obtains from its entire intrastate business a return as to the sufficiency of which in the aggregate it is not entitled to complain.[38]

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36. 236 U.S. 585 (1915).
37. *Id.* at 595. The lone dissenter, Justice Pitney, wrote no opinion.
38. *Id.* at 595-96.

As an example, Justice Hughes stated that if the firm "has held itself out as a carrier of passengers only, it cannot be compelled to carry freight."[39] This simple example from 1915 has a contemporary counterpart in the debates of the 1990s over mandatory unbundling of access to telephony and electric power networks: If the regulated firm has held itself out as an integrated network providing service directly to customers, can it be compelled to rededicate that network to providing service to other (unregulated) firms that compete with the regulated firm for sales to retail customers? *Northern Pacific Railway* says no. Given the relevance of that answer, it is remarkable that the public debate over the Telecommunications Act of 1996 appears never to have considered the question.

*Northern Pacific Railway* also established that the proposed redefinition is not made any more constitutionally permissible by the fact that the state intends that redefinition to serve an important public policy goal that materially benefits the state's residents. The Court considered it beside the point that North Dakota believed that the rates would "aid in the development of a local industry," an industry whose "infancy" and potential "to confer a benefit upon the people of the State" were matters of sincere concern to the state.[40] North Dakota's goal of "making the community less dependent upon fuel supplies imported into the State"[41] could not justify its resorting to an appropriation of private property as the means to achieve that objective:

> [W]hile local interests serve as a motive for enforcing reasonable rates, it would be a very different matter to say that the State may compel the carrier to maintain a rate upon a particular commodity that is less than reasonable, or--as might equally well be asserted--to carry gratuitously, in order to build up a local enterprise. That would be to go outside the carrier's undertaking, and outside the field of reasonable supervision of the conduct of its business, *and would be equivalent to an appropriation of the property to public uses upon terms to which the carrier had in no way agreed.*[42]

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39. *Id.*
40. *Id.* at 598.
41. *Id.*
42. *Id.* (emphasis added).

This passage illuminates the contemporary debate over the regulatory contract because its logic rests on the consensual nature of regulation: The firm dedicates its private property to a public purpose only as the result of voluntary exchange. Justice Hughes emphasized throughout the opinion that, although the legislature's discretion to set both general and particular rates is extremely wide and such rates enjoy a presumption of reasonableness, it is another matter entirely when the state acts to alter fundamentally the obligations imposed on the carrier by its acceptance of the original regulatory contract: "The constitutional guaranty protects the carrier from arbitrary action and from the appropriation of its property to public purposes outside the undertaking assumed . . . ."[43]

The Court's emphasis on the original understanding of the intended use of regulated property in *Northern Pacific Railway* sheds light on why, and the degree to which, the regulated firm would have willingly opted for asset specificity rather than asset generality in making its investments. If the regulated firm had expected that it could be required to use its dedicated property for a purpose other than that for which such property was originally dedicated, then the firm would have borne the risk that, in the newly designated purpose, the property might fail to earn a sufficient return originally understood by the utility and the municipality to be necessary to allow the firm to recover that capital and a competitive return on such capital over its useful life. Faced with such risk, the firm presumably would have opted instead for a different kind of capital having a lesser degree of asset specificity or a shorter useful life, or both. While investment in that alternative kind of capital would have reduced the risk to the regulated firm of having its regulated property redirected to an originally unintended use, that investment might not have been the most efficient capital in terms of minimizing the cost to society of producing the service in question. If so, then the regulator's rededication of the use of the dedicated property would impose a social cost.

There is an additional implication, relating to entry regulation, of the requirement that the regulator not rededicate the use to which regulated property is to be put. Some states have long forbidden municipalities to grant exclusive franchises for the provision of services such as local telephony and electricity.[44] Given that the absence of franchise exclusivity raised the risk that a utility would not

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43. *Id.* at 604.

44. E.g., TEX. CONST. art. I, § 26.

receive a reasonable opportunity to recovery its irreversible and nonsalvageable investment in network infrastructure, and given that the utility's rates were regulated not to exceed just and reasonable levels, why would the utility's investors nonetheless have been willing to risk their capital in this manner? Perhaps such investors received a risk premium relative to the return on capital for utilities in jurisdictions that did not forbid franchise exclusivity. But it seems at least as likely that such a premium was unnecessary because the risk was not appreciable. In other words, investors even in jurisdictions that forbade franchise exclusivity may have taken sufficient comfort in knowing that their transaction-specific investments were to dedicated to a *specific purpose*--namely, the provision of retail services *directly to customers* in the municipality that granted the franchise. Since the Supreme Court's decision in the *Express Package Cases* in 1885 it had been clear under the common law of common carriage that a public utility could not be required to sell interconnection to another carrier.[45]

And early cases such as *Pacific Telephone & Telegraph Co.* v. *Eshleman*, decided by the California Supreme Court in 1913, emphasized that a regulator could not mandate unbundled network access to accommodate a competitor, and that a state legislature could do so *only if* it paid just compensation to the incumbent utility.[46] Thus, when investors built the first local telephone networks under nonexclusive franchises, it would not have occurred to them, or to the municipality franchising them, that the municipality (or its successor, the state public utility commission) might subsequently rededicate such regulated property to the purpose of providing a rival firm the infrastructure with which to lure away the incumbent LEC's retail customers. Indeed, the early years of local telephony witnessed a race among competing facilities-based LECs with overlapping networks to maximize subscribership in a service area.[47]

The one form of potential competition that the utility and the municipality did originally envision was of a completely different sort. If competition were to occur, it would take the form of another utility receiving another nonexclusive franchise to build its own transaction-specific infrastructure. Yet, such facilities-based entry was not

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45. 117 U.S. 1 (1995); *see* MICHAEL K. KELLOGG, JOHN THORNE & PETER W. HUBER, FEDERAL TELECOMMUNICATIONS LAW 13-14 (Little, Brown & Co. 1992).

46. 166 Cal. 640, 664-65, 137 P. 1119, 1127-28 (1913).

47. MILTON MUELLER, UNIVERSAL SERVICE: COMPETITION, INTERCONNECTION, AND MONOPOLY IN THE MAKING OF THE AMERICAN TELEPHONE SYSTEM (MIT Press & AEI Press forthcoming 1996).

expected to occur because local exchange carriers and electric utilities were thought to be natural monopolies; indeed, such entry was considered futile and wasteful. That is why entry regulation taking the form of the prior grant of certificates of necessity and convenience placed so much emphasis on avoidance of duplicative facilities. In other words, neither the municipality nor the original franchised LEC ever expected that competitive entry would take the form of mandated access to the incumbent's network.

Furthermore, if the incumbent's network was to be occupied--in any degree--by some party other than the utility that owned it, that party was understood to be the municipality itself. Some franchise agreements gave the municipality the option to buy out the utility's network at the end of the franchise term for a price voluntarily negotiated by the parties or, in the case of deadlock, for a price set by arbitration.[48] Of course, at any time during the franchise term the municipality independently had the option simply to exercise eminent domain over the utility's network, which would trigger an analogous valuation process for determining just compensation for the forced buyout.

The relevance of *Northern Pacific Railway* to the FCC's 1996 interconnection order is encapsulated in the novel pricing methodology that the agency unveiled. The FCC introduced the concept of total *element* long run incremental cost (TELRIC), which is to be distinguished from total *service* long run incremental cost (TSLRIC). TELRIC embodies more than a new kind of costing exercise. It reflects a fundamental redefinition of the output of the regulated local exchange carrier. In the past, the output of a LEC consisted of services. After the FCC's 1996 interconnection order, the incumbent LEC's output has been redefined to consist of elements. The difference is significance in at least two respects.

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48. *E.g.*, An Ordinance Granting to Central Power and Light Company, Its Successors and Assigns, an Electric Light, Heat and Power Franchise, Corpus Christi, Texas § 4 (July 2, 1935) ("Upon the termination of this grant, the grant as well as the property, if any, of the Grantee in the streets, avenues and other public places, in the then city limits of the City of Corpus Christi, shall thereupon, upon a fair valuation thereof being paid to the Grantee, be and become the property of the City of Corpus Christi, and the Grantee shall never be entitled to any payment or valuation because of any value derived from the franchise or the fact that it is or may be a going concern duly installed and operated, provided, however, it shall be optional with the City of Corpus Christi whether or not it acquires title to said properties in said manner. . . . ").

First, the incumbent LEC built its network in the manner that it did so that it could discharge an obligation to serve--that is, to provide services to consumers. The incumbent LEC, however, now faces both an ongoing obligation to provide services to consumers and a new obligation to supply elements to competitors. The latter was never contemplated when the incumbent LEC dedicated the private property of its investors to a public purpose.

Second, there will likely be significant transactions costs of using the incumbent LEC's network to provide elements rather than services as its intended output. Those new costs are a cost of achieving the benefits that Congress and the FCC envisioned from the mandatory unbundling of local telephony. But it is neither efficient nor constitutional to make the shareholders of incumbent LECs absorb those costs. Rather, such costs must be fully recovered in the rates that an incumbent LEC may charge for unbundled elements. If demand conditions preclude setting prices at a sufficiently high level to recover those costs, then an end-user charge must be employed to recover the residual amount of cost beyond what can be recouped through the market-allowed price.

# X

# ACPR Pricing for Wholesale Services Is Unworkable and Will Lead to Inefficiency

The Kaserman Report recommends an adjusted form of M-ECPR pricing for wholesale services that is intended to penalize the incumbent LEC for assumed excess profits and inefficiency. The authors denote this procedure the Avoided Cost Pricing Rule (ACPR), perhaps to make it appear consistent with Section 252(d)(3) of the *Act*. Under the ACPR, the wholesale price of a service is given by the following formula:

$$P_w = P_R - TSLRIC_R - X_R - \pi_R$$

where:

| | | |
|---|---|---|
| $P_w$ | = | Wholesale price; |
| $P_R$ | = | Retail price; |
| $TSLRIC_R$ | = | Total Service Long Run Incremental Costs (TSLRIC) per unit incurred at the retail level; |
| $X_R$ | = | Dollar value (per unit) of production inefficiencies of the incumbent LEC at the retail level; and |
| $\pi_R$ | = | Excess economic profit at the retail stage, which is constrained to be non-negative. |

Furthermore, the Kaserman Report defines the TSLRIC of retail service as ". . . all of the costs associated with the retail activities of the ILEC that will be avoided when the ILEC ceases to perform those retail activities."[1] By definition, then, the avoided cost of retail is equal to the costs that will be avoided if the ILEC exits the retail function entirely. Note also that the TSLRIC of retail service excludes any incremental costs due to wholesaling.

Each of the components is problematic from the standpoint of either economic efficiency or practicality, or both. If implemented, the ACPR would require a rebirth of cost-of-service regulation that would retard greatly the growth of local exchange and interLATA competition in the telecommunications industry. We discuss each component in turn.

### A. TOTAL SERVICE LONG RUN INCREMENTAL COSTS AT THE RETAIL LEVEL ($TSLRIC_R$)

To the superficial eye, it may appear "reasonable" to calculate the avoided cost of resale by assuming that the incumbent LEC (ILEC) leaves the retail market altogether. However, this assumption overlooks two important facts. First, that avoided retail cost per unit is generally an increasing function of the amount of retail business lost. Second, in the normal course of events, wholesale customers of the ILECs will be taking away retail business from the ILEC in increments far smaller than the ILEC's entire business.

Figure X-1 depicts the avoided long run cost (per unit) as a function of the percentage of the ILEC's retail business lost. The solid circles on the curve represent actual calculations based on GTE data. Now suppose that an alternative LEC were to capture 20 percent of the ILEC's retail business. According to the curve in Figure VII-1, this would save the ILEC an amount equal to 10 percent of the retail price. Even if the alternative LEC has the same retailing costs as does the ILEC, this does not put the two firms on an equal footing under the Kaserman Report proposal. According to the proposal espoused in the Kaserman Report, the actual wholesale discount would be 30 percent, based on the assumption that the alternative LEC was capturing all the ILEC's retail business. Thus, the wholesale discount would exceed the ILEC's actual cost savings.

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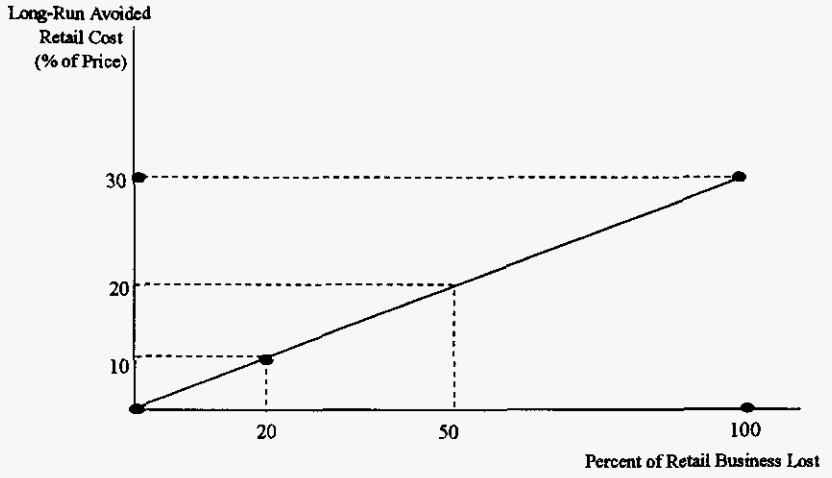
1. Kaserman Report, at 18.

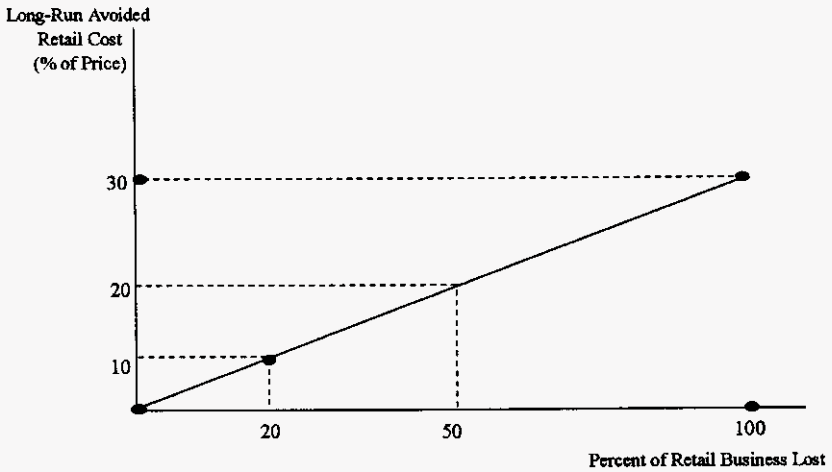
The avoided-cost calculation advocated in the Kaserman Report permits an alternative LEC to profitably enter even if its own retailing costs are considerably higher than those of the ILEC. For example, if the wholesale discount is 30 percent, then an alternative carrier whose own retail costs are 20 percent of $P_R$ at a 20 percent market share could profitably enter, even though the cost to society of having 20 percent of the retail market served by the alternative LEC is twice as high as if it were served by the ILEC. This process continues, so that if the wholesale discount is set at 30 percent of $P_R$ and if the alternative LEC is equally efficient to the ILEC, the ILEC must necessarily lose the whole retail market.

FIGURE X-1
LONG RUN AVOIDED RETAIL COST
AS A PERCENTAGE OF RETAIL BUSINESS LOST




Even if the alternative LEC is less efficient than the ILEC, it can still take away retail business profitably. In Figure X-2 the avoided-cost curve of the alternative LEC lies above that of the ILEC, meaning that by serving more customers it incurs a higher cost than does the ILEC. As the curve is drawn, the alternative LEC can take away up to 70 percent of the ILEC's retail business, even though the retail cost to society is higher as a result.

FIGURE X-2
INEFFICIENT ENTRY ENCOURAGED BY THE
AVOIDED COST CALCULATION IN THE KASERMAN REPORT




## B. RETAIL PRODUCTION INEFFICIENCIES ($X_R$)

The very premise for this adjustment is misguided. Its motivation is that regulated firms such as ILECs have no incentives to be productively efficient and, hence, must have substantial excess costs. For example, in GTE's three largest states, California, Florida, and Texas, price-cap regimes are in effect. In California, the price-cap plan has frozen nominal prices since the beginning of 1996 and from 1990 to 1995 had a high productivity offset (4.5%). According to the price-cap formula, price ceilings for retail prices adjust annually according to rate of change in inflation, less the firm's expected productivity *vis-à-vis* the rest of the economy. That is, if inflation grew at a rate of 3 percent and expected productivity was 4.5 percent, prices would decline by 1.5 percent (i.e., 3 percent less 4.5 percent). The higher the productivity offset, the greater the firm's incentive to cut costs. In those states in which GTE operates under rate-of-return regulation, prudency reviews serve to monitor the firms costs, while "regulatory lag" provides an incentive to reduce costs.

A second difficulty is practicality. The very definition of $X_R$ involves a comparison between the current efficiency of GTE and an outside calculation of "maximum" efficiency. Such a comparison is impossible to make with any degree of accuracy, particularly in the

time frame during which wholesale pricing decisions must be made by state and federal regulators. Consider, for example, the problem of simply specifying the standard of comparison. Cost would have to be computed dynamically, taking into account not only the features of GTE's network, but also projected demands for services -- including hard-to-model effects of competition -- as well as regulatory constraints involving service quality and universal service. This is a modelling exercise so grandiose and complex that it could take months or years before all parties could agree on the technical details of how to specify the problem, let alone how to evaluate the results.

The Kaserman Report suggests that it is not necessary to compute $TSLRIC_R$ and $X_R$ separately. Instead, the authors propose subtracting out embedded unit cost from revenues and using that value as a proxy. This procedure would be correct only if there were no shared costs or common costs. In the presence of shared costs and common costs, the result of the procedure suggested by the Kaserman Report will be to get the sum of $TSLRIC_R$ and whatever portion of shared costs and common costs is allocated to the service in question. Even with no inefficiency at all, this procedure results in an overestimate of proper wholesale discount, which is $TSLRIC_R$. For a large service like local toll, where significant resale competition is to be expected, this effect will be especially large. Because the $X_R$ term would need to be calculated separately for each of GTE's dozens of services, this procedure would amount to setting the wholesale discount by some form fully distributed costs.

Because the alternative LECs need consider only their *incremental costs* of retail, then if they and the ILEC are of equal efficiency, the ILEC can never win. It would be required to offer a wholesale discount greater than $TSLRIC_R$, even if it were perfectly efficient. Thus, all of the retail business would inevitably go to the alternative LEC. Furthermore, this could happen even if the alternative LEC was less efficient than the ILEC, as long as the alternative LEC's incremental cost of retailing did not exceed the ILEC's fully distributed cost for the service in question.

In sum, the Kaserman Report's proposal to subtract $X_R$ from the retail price leads to either one of two dead ends. Either $X_R$ is computed directly, which is hopelessly complex, or the wholesale discount is set through fully distributed cost methods which guarantee that the ILEC gives a sure profit to an equally efficient alternative LEC.

## C. THE ROLE OF MONOPOLY PROFITS ($\pi_R$)

Computing monopoly profits, $\pi_R$, is even more problematic than computing $X_R$. In addition, there is a formidable problem of what one would look for in deciding on a definition of excess profit, given that GTE is subject to traditional costs-of-service regulation in very few states.

Consider the problem involved with the $\pi_R$ offset is that in those states GTE companies are under some form of incentive regulation with wide limits on its rate of return. In California, for example, GTE's rate of return can vary from 7.75 percent up to 13 percent without triggering regulatory action. In such a case, how would the Kaserman *et al.* propose to decide what is an excess profit? The California Public Utilities Commission (CPUC) has already decided that in the interests of providing performance incentives, and in exchange for a rate freeze, GTE's rate of return should not be subject to micro-management. To include a $\pi_R$ offset to the wholesale price would require an entire new rate of return proceeding in each GTE state. Furthermore, in states such as California, inclusion of the $\pi_R$ offset would amount to profit sharing even if GTE were within the no-sharing band, which would violate that Commission's regulatory framework. To include the $\pi_R$ term is to abrogate the earnings-sharing mechanisms that currently exist.

The next conceptual problem with $\pi_R$ comes from its definition as excess profit from the retail business. Presumably the starting point for this would be the difference between $P_R$ and $TSLRIC_R$. However, this is a misleading calculation since some or all of this difference is needed to cover shared costs and common costs, as well as to keep basic exchange rates low. Indeed, it is hard to know what to make of the contribution earned on a particular retail service, since it expected that the ILEC may earn a high contribution on some of its services, in order to keep prices for other services (such as basic residential service) low.

Finally, the Kaserman Report ignores the incentive effects of $\pi_R$. To the extent that contribution for a particular service is high, this may well be due to increased efficiency of the ILEC. The $\pi_R$ offset directly penalizes the ILEC for this efficiency and deters the ILEC from further reductions in cost, lest they lead to further rises in $\pi_R$.

In sum, practical difficulties accounting difficulties in computing would make the ACPR impossible to implement without

new litigation and extensions of regulatory control. The incentive effects make the $\pi_R$ offset inefficient on economic grounds.

# XI

# TSLRIC Pricing of Unbundled Network Services Creates Economic Inefficiency

The Kaserman Report recommends that the prices for unbundled network elements be set equal to the Total Service Long Run Incremental Cost per unit (TSLRIC).[1] To be sure, TSLRIC pricing certainly is simple to understand. It would be a mistake to equate simplicity with accuracy, however. Although there are conceivably some savings in administrative costs to "getting pricing right," those possible cost savings are trivial compared with the short-term and long-term market distortions that would be certain to result from taking the easy way out. TSLRIC pricing is overly simplistic because it is simply the wrong pricing policy.

The problem with TSLRIC pricing generally is that it does not equal economic costs. That is why TSLRIC pricing creates economic inefficiencies. The problems with TSLRIC pricing outlined below stem from that basic defect.

## A. TSLRIC Pricing Does Not Reflect the Firm's Total Direct Costs

The incremental cost of production is of value to the firm when it makes decisions comparing incremental revenue with incremental cost. However, because a multiproduct firm has shared costs and common costs, TSLRIC pricing does not provide a complete picture of the firm's direct costs.

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1. In the FCC's parlance, the term TELRIC would be used in place of TSLRIC.

Certainly, there are circumstances in which TSLRIC pricing equals the firm's economic costs of production. If the firm provides only one service, then the incremental cost and stand-alone cost of the service are equal, and incremental pricing provides an accurate estimate of the firm's costs of production. If the firm provides multiple services, but the services have no shared costs or common costs -- that is, there are no economies of scope -- then incremental cost pricing provides an accurate estimate of the costs of production. These circumstances do not describe the technology and cost of local exchange telecommunications.

If all of the firm's services were to be sold at their TSLRIC, then the firm's total costs would not be covered. The difference between a firm's total costs and the sum of that firm's incremental costs is equal to the firm's shared costs and common costs. Thus, under TSLRIC pricing the firm would incur losses exactly equal to this remainder -- that is, the firm's shared costs and common costs.

The firm's shared costs and common costs are precisely its economies of scope, which means that they are the firm's efficiency gains from jointly producing multiple services. To price without regard to those cost is to penalize a firm for its efficiencies.

Because TSLRIC pricing fails to recover any of the incumbent LEC's shared costs or common costs, it interferes with the LEC's opportunity to earn a fair rate of return on its investment or even to recover its investment. That outcome violates section 252(d) of the Telecommunications Act, which calls for the firm to recover its costs, with pricing that may include a reasonable profit. TSLRIC pricing *guarantees* losses and thus is confiscatory. Policy that requires TSLRIC pricing would therefore constitute a taking.

Some would suggest that the firm subject to TSLRIC pricing can make up its losses elsewhere, perhaps from retail sales. Although appealing on the surface, such a suggestion requires that earnings from other services be sufficient to cover shared costs and common costs. Such an unfounded belief can easily fail to be consistent with market conditions. Competition need not lower margins on those services identified by competitors in their unbundling requests, it is just as likely to do so on the remaining services. Indeed, with TSLRIC pricing, competitors are most likely to purchase those services that would have a markup in a competitive market, in order to free-ride on the LEC. Competitive firms are able to stay in business when they recover joint and common or shared costs through revenues above incremental costs. The market-allowed contribution of "other services" cannot be predicted *a priori*. What is certain is that a firm that does not cover its joint and common or shared costs will not remain in business very long.

### B. TSLRIC Pricing Does Not Reflect the Firm's Economic Costs

TSLRIC pricing is not efficient because it does not reflect the LEC's economic costs, which include the direct incremental cost *plus* the opportunity costs of the facilities to which the incumbent LEC is providing access. The TSLRIC pricing method is neither efficient nor compensatory because the LEC will not be allowed the opportunity to recover its economic costs.

Pricing the firm's outputs sold to customers differs from pricing the firm's inputs sold to competitors. The economic costs can be expected to differ. The incremental economic costs of inputs sold to competitors must equal the direct economic costs and the opportunity costs to the firm of those inputs. To exclude the firm's opportunity costs in one's definition of costs, as do advocates of TSLRIC pricing, is simply an argument by competitors for a free ride, not an assertion about economic efficiency.

### C. TSLRIC Pricing Should Not Be Confused with Competitive Pricing

Some economists and regulators justify TSLRIC pricing by analogizing it to marginal cost pricing. That justification is based on a misunderstanding of one the most basic principles of economics. It is true, of course, that when price exceeds the marginal cost of production, there may be additional benefits to consumers from expansion of output to the point where marginal cost equals the price. That does not imply, however, that utility regulators should set prices for any and all services at their marginal cost (the cost of producing the last unit) or at average incremental cost (the incremental cost of producing the service divided by the number of units of the service provided). There are several fundamental problems with jumping to that conclusion.

With marginal cost pricing, costs are not covered in the presence of economies of scale (or, in the case of a multiproduct firm, when there are economies of scale and scope). Economists are familiar with the problem of pricing a bridge that costs $100 to build. The marginal cost of providing the services of the bridge are zero. What should be the price of crossing the bridge?[2] Efficiency considerations

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2. J. Dupuit, *On the Measurement of the Utility of Public Works*, in Readings in Welfare Economics 255 (Kenneth J. Arrow & Tibor Scitovsky eds., Irwin 1969);

alone might suggest pricing at zero. Yet, the bridge then would not be economically viable. One solution would be to finance the bridge using general taxation. That policy, however, would transfer income to users of the bridge from those taxpayers who are not users of the bridge. Whether such a solution is viewed as efficient depends on how income transfers are to be evaluated in determining the effect on social welfare. These income transfers have consequences for economic efficiency. Accordingly, it is desirable for users of the bridge to pay for the cost of the bridge.[3]

The analogy between competitive markets and regulated pricing as a guide to efficient pricing is somewhat strained. Even in the ideal case of "perfect competition" covered in the basic economic textbooks cited by Professors Kaserman et al, competitive firms cannot be said to price at marginal cost. Rather, the "perfectly competitive firm" takes the market price as a given and offers its output for sale at the market price. The firm, in this theoretical ideal case, sets its *output* level such that the firm's marginal cost equals the market price. This is how in equilibrium the marginal cost of the firm equals the market-clearing price. This is different from the problem of a regulator seeking to determine the marginal cost of the regulated firm. The regulated firm's marginal cost will vary depending on the types of services and the volume of services that the firm offers. For regulators to determine what price equals the firm's marginal cost, *at the level of services demanded at that price*, is a fundamentally different and more complex problem. To make that determination, regulators not only would have to predict marginal costs at each level of output over a relevant range, but also would have to make projections of the quantity demanded of those services at the relevant prices so as to determine the equilibrium prices.

Finally, when textbooks speak of the marginal or incremental cost of the firm, they are referring to the firm's marginal *economic* cost. As any textbook will indicate, economic costs of the firm's inputs refer to the direct cost of purchasing the inputs or the imputed *opportunity cost* of inputs that are not purchased. The firm's costs refer to the costs of the inputs used by the firm, with the cost function

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Harold Hotelling, *The General Welfare in Relation to the Problems of Taxation and of Railway and Utility Rates*, 6 ECONOMETRICA 242 (1938).

3. To further illustrate how TSLRIC pricing fails to be a useful solution when there are significant shared costs and common costs, suppose now that the bridge accommodates both passenger cars and pedestrians. Again, the incremental costs of allowing each type of service equal zero. The shared costs and common costs are $100. Advocates of TSLRIC pricing would suggest pricing the bridge at zero for both passenger cars and pedestrians. As before, the bridge would not remain economically viable.

of the firm defining the minimum cost of producing output given the firm's technology and cost of inputs.

### D. TSLRIC PRICING PROMOTES FREE RIDING BY COMPETITORS

TSLRIC pricing fails to address the problem of selling inputs to competitors. To illustrate these issues clearly, imagine a fast-food stand that offers both hot dogs and hamburgers, each of which is cooked on the same grille. The unit incremental cost of cooked hot dogs to the firm is $1, and the unit incremental cost of cooked hamburgers is $2. The total cost of the grille is $100. The fast-food stand charges its customers $1.50 and $2.60 for hot dogs and hamburgers, respectively, allowing the firm to cover its shared costs and common costs.

Proponents of TSLRIC pricing would have that fast-food stand sell cooked hot dogs and hamburgers to rival fast-food sellers at $1 and $2, respectively, ignoring the shared costs and common costs of the grille, which is the capital of the fast-food stand. The rivals could then offer the cooked hot dogs and hamburgers to the firm's customers at prices that are equal to or lower than the prices of the fast-food stand. Without question, this free riding would increase competition for the fast-food stand that owns the grille, so much so that the firm would be driven out of business. But such a pricing solution does not conform with any pricing behavior actually observed in a competitive market, and it cannot be justified on grounds of economic efficiency.

### E. TSLRIC PRICING SUBSIDIZES ENTRANTS

Some proponents of TSLRIC pricing may argue that prices set at TSLRIC do not involve cross subsidies, so that TSLRIC pricing would rebalance rates. That claim is simply false. The "incremental cost" test for cross subsidization requires that each service, *and each combination of services*, must cover its incremental cost.[4] This outcome easily fails to occur with TSLRIC pricing as soon as the firm produces more than two services and any group of services has shared costs. This result is illustrated by the following example with three services.

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4. *See, e.g.*, WILLIAM J. BAUMOL & J. GREGORY SIDAK, TOWARD COMPETITION IN LOCAL TELEPHONY 69-72 (MIT Press & AEI Press 1994).

| | | |
|---|---|---|
| Incremental cost of service A | = | $1 |
| Incremental cost of service B | = | $1 |
| Incremental cost of service C | = | $1 |
| Shared cost of service A and B | = | $5 |
| Total cost of all services | = | $8 |

The example shows that the incremental cost of services *A* and *B* taken together is $1 + $1 + $5 = $7. TSLRIC pricing would set the price of each service at $1. Services *A* and *B* taken together would have revenues of $2, which would fail to cover their $7 incremental cost. Thus, TSLRIC pricing creates cross subsidies.

In a general sense, TSLRIC pricing creates cross subsidies when multiple services are available that have shared costs or common costs. Those costs do not magically disappear. Failure to cover those costs makes those services available collectively at less than their total costs.

What are the consequences of cross subsidization? Entrants will make efficient decisions about the mix of resale and facilities-based competition only if their access to existing networks is provided at prices that accurately reflect economic costs. Subsidizing services by pricing them at TSLRIC sends the wrong price signals and leads to incorrect decisions. When prices are too low, excessive use of underpriced facilities will result and thus distort the decisions of resellers. The entry and expansion of resellers is thus not only encouraged, but also financed by underpriced facilities.

Moreover, when network services are priced too low, the building of competing facilities is likely to be discouraged. Thus, rather than stimulating facilities-based competition, TSLRIC pricing discourages it. Why should an entrant seek a competitively priced alternative when it can free-ride on the LEC's facilities at below-cost prices? TSLRIC pricing turns out to be a misnomer: It should more appropriately be termed "individual-service LRIC," for it ignores the incremental costs of *combinations* of services.

Indeed, the problem is compounded by unbundling "at any technically feasible point," as envisioned by section 251(c)(3) of the Telecommunications Act.[5] Finer and finer partitioning of services wrings out the shared costs from TSLRIC prices and thus increases the subsidies inherent in such pricing. In the limit, the finer partitioning of services creates TSLRIC prices that will not cover the incremental costs of *any* pair or group of services that have shared costs.

5. 47 U.S.C. § 251(c)(3).

## F. TSLRIC CREATES INCENTIVES FOR EXCESSIVE UNBUNDLING BECAUSE IT IGNORES THAT UNBUNDLING SHIFTS COSTS FROM ATTRIBUTABLE COSTS TO SHARED COSTS AND COMMON COSTS

A firm cannot apply any pricing methodology independently of the characteristics of the products and services for which prices are being chosen. On the demand side, the characteristics of the products and services will affect the willingness of consumers to pay for those products and services. On the supply side, if the firm sets prices subject to regulatory controls based on its costs of service, then the definitions of the products and services will significantly affect the costs that are attributable to those products and services.

The pricing methodology that regulators adopt for resale and unbundled network elements should be flexible enough to adapt to the regulations governing the extent of unbundling. Efficient and compensatory pricing must allow the firm to recover its economic costs, including both its attributable costs and its unattributable costs ¾ namely, its shared costs and common costs.

The measurement of costs depends on the definition of the firm's services. For a multiproduct firm, changes in the definition of classes of services and individual services will affect measures of incremental cost. Generally speaking, the more services that are defined by subdividing sets of services, the lower the attributable costs of individual services, and the higher the shared costs and common costs of those service. Without any increase or decrease in total costs, it is simply more difficult to identify the attributable costs of a particular service as one moves toward higher levels of disaggregation in the classification of services.

Suppose, for example, that a company produces services that are grouped into two categories, *A* and *B*, and each category of services is sold as a bundle. The average incremental cost of category *A* is $10. The same is true of the average incremental cost of category *B*. Moreover, the firm has common costs of $20. Suppose that there are two services within category *A*, each of which has an incremental cost of $4, and that the two services have shared costs of $2, for a total of $10. By unbundling services in category *A*, the shared costs and common costs of the firm rise by $2 to $22.

Therefore, unbundling has the effect of decreasing the proportion of costs that are attributable and correspondingly increasing the proportion of total costs classified as shared or common. To the extent that the degree of unbundling follows regulatory dictates, the resulting service definitions may bear little relation to technological

and managerial measurements of costs. Consequently, it becomes increasingly difficult to identify the firm's underlying cost components. Reliance on regulatory accounting measures, based on regulatory service classifications and unbundling requirements, is likely to cause inefficient decisions concerning the pricing of network components. That inefficient outcome is particularly likely to occur if, as one would expect the packages of retail services that the LEC offered before the imposition of mandatory unbundling were intended to facilitate optimal management decisions about pricing and service offerings.

This effect of unbundling on cost calculations counsels regulators to take careful account of the interplay between unbundling requirements and pricing. Competing carriers have an incentive to request pricing at incremental cost to the LEC as a means of obtaining network services in a manner that avoids paying for the LEC's shared costs and common costs. Further, by requesting a finer and finer partition of LEC services into unbundled components, competitors shift costs away from measures of incremental cost and toward measures of shared costs and common costs. In the limit, groups of services may individually have negligible incremental costs, even though as a group, their shared costs and common costs are significant.

TSLRIC pricing thus creates a perverse incentive. Unbundling requests from competitors using LEC services may be strategic actions, rather than legitimate requests for access to network services. Competitors not only avoid paying a portion of shared costs and common costs, but also have an incentive to request ever finer partitions of services, and interconnection at every technologically feasible point, so as to shift costs farther away from incremental costs and into shared and common costs. This strategic opportunity allows competitors to "free ride" on the LEC.

M-ECPR pricing avoids those perverse incentives because competitors must pay for the costs of the services that they purchase ¾ both the incremental costs and a portion of the shared costs and common costs. By allocating shared costs and common costs in a competitively neutral manner, M-ECPR pricing eliminates the incentive for competitors to make strategic requests for excessive unbundling. Instead, a competitor will purchase resale and unbundled network elements on the basis of its market prospects rather than as an attempt to game the regulatory system.

## G. TSLRIC PRICING FAILS TO INCLUDE INCREASES IN SHARED COSTS AND COMMON COST THAT RESULT FROM UNBUNDLING

Unbundling has costs. The provision of resale services and network components entails two types of costs: transactions costs and production costs. Unbundling should not be an end in itself, because the bundling of products and services reduces customer transaction costs and enhances convenience. Access to a few types of local network elements is sufficient to achieve the objectives of deregulation. Competitive markets are capable of resolving the tradeoff between the need to customize offerings and the advantages of bundling. The costs of mandated unbundling must be reflected in estimates of the LEC's incremental costs, shared costs, and common costs and thus included in the prices for resale and unbundled network elements.

Peter Huber has emphasized that "unbundling imposed on a LEC service that faces competition will, at best, only raise prices and inconvenience customers."[6] With the many forms of competition in the local exchange, many unbundling regulations are rendered unnecessary. As Huber has noted, bundling in a competitive market is self-regulating: "If private branch exchanges (PBXs) compete directly against LEC-supplied Centrex service, then it makes no sense to order the unbundling of either. Suppliers of both PBXs and Centrex will bundle or unbundle as customers demand, or will quickly lose ground to more responsive competitors."[7] He has argued that regulators "should not unbundle 'interfaces,' 'functions,' or 'capabilities,' still less the billing and ordering systems used to sell them."[8] Regulatory commissions can achieve their open access goals with limited unbundling; they need only selectively target several points of entry to the local exchange network that are shown not to be competitive and then price that network access at compensatory levels.

Unbundling entails transactions costs in comparison with goods and services that are sold together, because the firm must break down ordering, purchasing, billing, and pricing information for individual components.[9] For this reason, many goods and services are

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6. Peter W. Huber, *Competition and Open Access in the Telecommunications Markets of California* (Feb. 8, 1994).

7. Id., at 7.

8. Id., at 112.

9. Most products and services offered by competitive companies are bundles of attributes or features. Customers also benefit from the convenience of purchasing a range of products and services from the same supplier that offers lower transactions costs through "one-stop-shopping" and bundling of products and services.

sold as packages. Imagine buying an automobile or even a computer part by part. The final product is not only a physical package of components, but is also sold as a single product requiring only one set of transactions. Even when automobiles are customized with options, customers receive discounts when they choose standardized options packages. The greater the extent of standardization of bundles of features offered to either the customers or the competitors of the LECs, the lower will be the transactions costs associated with offering those features. Conversely, the more that regulatory commissions require that each retail service or network component be sold separately, or in individually customized service packages, the greater will be the associated transactions costs.

Excessive unbundling is not only inefficient and unnecessary. It entails products costs as well. To unbundle retail services and network components, the LEC often needs to install complex switching equipment and to provide additional interconnection facilities for competitors. As with transaction costs, the more such resale and access facilities can be standardized, the lower will be the associated costs. If unbundling and regulated pricing requirements shift the costs to the LECs, competitors will have an additional strategic incentive to demand unique, customized wholesale and access services from the LEC.

The transaction costs and production costs due to unbundling represent *wholesaling* costs for the LEC. The incremental wholesaling costs that are attributable to individual services or elements must be included in their prices. In addition, any increase in shared costs or common costs that result from unbundling also should be reflected in the prices for resale and unbundled services. A competitive firm would not provide a service if it did not generate sufficient revenues to cover its costs. Regulators should account for wholesaling costs in their pricing rules. If competitors do not bear the full economic costs of the services that they purchase, they will not make efficient purchasing and investment decisions.

TSLRIC pricing will capture wholesaling costs if and only if all these costs are attributable. But it will not capture those transaction costs and production costs due to wholesaling that increase shared costs or common costs. Thus, TSLRIC pricing will fail to reflect the full economic costs of unbundling.

The inefficiencies associated with the transaction costs and production costs of specialized services under mandatory unbundling are a problem when costs are shifted to the LEC's other customers or

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Companies compete by offering packages of goods and services that enhance customer convenience.

when the LEC is expected to shoulder those costs as a means of easing the transition to competition. Unbundling becomes an incumbent burden that potentially hinders the LEC's ability to compete and subsidizes new entrants thereby distorting their decisions about how much to invest in competing facilities. Just as overpriced network services can induce inefficient bypass decisions, so also can subsidized wholesale services can induce under-investment and overuse of network components relative to less costly alternatives.

### H. TSLRIC Pricing Creates Incentives for the Incumbent to Reduce its Common Costs or Shared Costs

Because TSLRIC pricing fails to compensate the LEC for its shared costs and common costs, adoption of such pricing would create an incentive for the LEC to reconfigure its network and change the structure of the company so as to increase the proportion of costs that would be attributable to those services priced at TSLRIC, and to lower costs that would be classified as shared costs or common costs. This shift in the LEC's cost structure would not represent efficiency gains: By *lowering shared costs or common costs*, the company would potentially increase *total* costs because it would lose some of the benefits of economies of scope. Moreover, the reductions in uncompensated shared costs or common costs that are necessary to enable the firm to break even could result in a lowering of the quality of service or the elimination of some services that are uncompensated. Thus, TSLRIC pricing creates a situation that is ripe for the law of unintended consequences.

### I. TSLRIC Pricing Lacks Dynamic Pricing Flexibility and Creates Incumbent Burdens

TSLRIC pricing lacks dynamic flexibility, for there is no room for price adjustment. Pricing at the lowest possible level is not sustainable in the long run because no company can continue to operate indefinitely without covering its shared costs and common costs.

Proponents of TSLRIC pricing argue that because prices in competitive markets tend toward incremental costs, regulators should reduce price to its lowest level. That argument is flawed because it presupposes that the competitive market eliminates all margins over marginal cost. To the contrary, competitive markets determine the size of relative margins on products depending on many factors, including the extent of shared costs and common costs, demand elasticities,

product differentiation, transactions costs, and marketing and sales efforts.

A system of price caps protects consumers from price increases while allowing competitive price decreases. TSLRIC, however, is inconsistent with price caps. It does not allow prices to be adjusted in response to competition. Regulators should not adopt TSLRIC pricing to pursue a mistaken representation of how markets operate. Instead, regulators should let competition determine the margins on unbundled services. TSLRIC pricing, by automatically eliminating *all* margins, leaves the incumbent LEC no room for competitive price adjustment and thus creates a competitive disadvantage relative to new entrants.

The Telecommunications Act of 1996 offers a unprecedented opportunity for further growth of competition in local exchange telecommunications. As a precondition, however, the *Act* requires additional regulation of prices for resale and unbundled services. To achieve the intended benefits of competition, it is essential that regulatory commissions grant LECs sufficient flexibility to adjust their prices for resale and unbundled network services to reflect customer demand and market conditions. Regulatory rules for pricing of resale and unbundled services should allow the LECs to recover their economic costs, including the additional costs of following unbundling rules. If prices for resale and unbundled network services are to be regulated, then price controls should not discriminate against the LECs by placing them at a competitive disadvantage in the marketplace.

Regulatory commissions should allow the LECs the same flexibility in pricing and defining unbundled services that is available to the competitive local exchange carriers. Regulators should not mandate excessive unbundling of the "components" of demonstrably competitive services, for competitive markets suffice to determine the efficient extent of unbundling.

Whether the LEC is providing services to retail customers or to other telecommunications companies, negotiation and competition should be relied upon as much as possible to price services and to resolve whether particular services should be offered in combination with others or "a la carte." TSLRIC pricing is an extreme negotiating position taken by competitive local exchange carriers seeking access to network services and elements at prices below economic costs.

The regulatory commission should not establish pricing and unbundling restrictions that bias decisions about the type of technology a carrier may employ to offer local service. The absence of such restrictions should apply equally to LECs and competitive local exchange carriers. The pricing of unbundled services should be determined by customer choice and competitive interaction between

LECs, the competitive local exchange carriers, and the many other providers of transmission capacity. TSLRIC pricing can bias technology choice by eliminating the rewards from economies of scope, thereby encouraging separation of network services into components associated with incremental costs.

## J. TSLRIC PRICING IS DISCRIMINATORY

TSLRIC pricing is discriminatory because it creates subsidies for entering competitive local exchange carriers at the expense of the LECs. As we have demonstrated, TSLRIC pricing does not cover the LEC's direct economic costs, because it ignores shared costs and common costs. Moreover, TSLRIC pricing creates cross subsidies because it yields revenues that fail to cover the incremental costs of any two or more services that have shared costs. TSLRIC pricing further fails to cover the LEC's economic costs because it ignores the LEC's opportunity costs when it is compelled to sell inputs to competitors.

No competitive firm would agree to pricing below costs. No competitive firm could offer services that subsidize one another, or that contain subsidies for competitors and thus encourage free-riding on its facilities. By forcing the LEC to accept prices that would never be agreed to by a competitive firm, TSLRIC pricing places the LEC at a competitive disadvantage relative to its competitors. Facilities-based competitors certainly will not be subject to such pricing regulations. The discriminatory impact on the LECs of TSLRIC pricing is undeniable.

# XII

## The FCC's *First Report and Order* Effects a Taking

The FCC's *First Report and Order* in its 1996 interconnection proceeding established a blueprint for the uncompensated taking of the incumbent LEC's private property. The FCC's order had that effect because it (1) denied recovery of historic costs incurred by the incumbent LEC to discharge its obligation to serve; (2) allowed the incumbent LEC to recover only a "reasonable" portion, not all, of its shared costs and common costs that cannot be captured in the total element long run incremental cost (TELRIC) of a network element; (3) forbade the incumbent LEC to recover shared costs and common costs on network elements (particularly loops) that have a low enough price elasticity of demand to bear higher levels of cost recovery without exceeding an entrant's stand-alone cost for that particular element; and (4) forbade the incumbent LEC to pursue cost recovery by charging up to stand-alone cost for unbundled network elements other than loops. Consequently, the FCC has foreclosed the possibility that the incumbent LEC will be able even to achieve the recovery of forward-looking costs that the agency's order purports to endorse. We consider now each of the four preceding factors by which the FCC has denied the incumbent LEC full recovery of all the economic costs that it incurred to discharge its obligation to serve the public.

### A. PROHIBITION ON THE RECOVERY OF HISTORIC COSTS

The FCC's order precludes the recovery of the incumbent LEC's historic costs through the prices charged for mandatory access to unbundled network elements. The FCC stated that "the sum of the direct costs and the forward-looking common costs of all elements will likely differ from the incumbent LEC's historical, fully distributed

costs."[1] The Kaserman Report similarly rejects using the price of mandatory network access to recover any portion of historic, embedded costs.[2] It bear emphasis, in contrast, that even the efficient component-pricing rule does not guaranty full recovery of historic costs because the market-allowed M-ECPR price of a network element is at all times capped by the entrant's stand-alone cost of producing that element by the least-cost technology then available. Consequently, as we explained in Part III, even a system of M-ECPR prices for network access will have to be accompanied by an end-user charge to make the incumbent LEC whole for its stranded costs and thus avoid a taking.

### B. PROHIBITION ON THE RECOVERY OF ALL FORWARD-LOOKING COSTS

In its August 1996 order, the FCC endorsed the pricing of unbundled network elements according to a rule that would give the incumbent LEC its TELRIC plus some amount of "forward-looking common costs."[3] The FCC reasoned:

> Given . . . common costs, setting the price of each discrete network element based solely on the forward-looking incremental costs directly attributable to the production of individual elements will not recover the total forward-looking costs of operating the wholesale network. Because forward-looking common costs are consistent with our forward-looking, economic cost paradigm, a *reasonable* measure of such costs shall be included in the prices for interconnection and access to network elements.[4]

It is telling that the FCC did not state that "the *full* measure of such costs shall be included in the prices for interconnection and access to network elements." If the shared costs and common costs in question are indeed forward-looking, and if the FCC indeed purports to endorse the pricing of mandatory network access on the basis of forward-looking costs, then it is incongruous for the agency to permit the incumbent LEC to charge the entrant for only some portion of those forward-looking costs. Plainly, the deficit in the amount of forward-

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1. *Id.* at ¶ 698.
2. Kaserman Report, at 12-14.
3. *First Report and Order, supra* note 1, at ¶¶ 694-98.
4. *Id.* at ¶ 694 (emphasis added; footnote omitted).

looking costs that the incumbent LEC will be allowed to recover will be tantamount to a direct subsidy from the LEC to entrants.

The FCC has read the 1996 legislation as promoting competition in the local exchange without regard to whether that competitive entry is efficient. But even that questionable interpretation of the public interest cannot justify the FCC's forced transfer of wealth from the shareholders of incumbent LECs to the shareholders of the entrants firms--which, far from being infant firms, are giant corporations such as AT&T, MCI, and Time-Warner.

### C. PROHIBITION ON THE RECOVERY OF SHARED COSTS AND COMMON COSTS IN THE PRICING OF THE FEW NETWORK ELEMENTS THAT CAN CONTRIBUTE TO RECOVERY OF UNATTRIBUTABLE COSTS

The FCC offered two cost-allocation methods by which an incumbent LEC would be allowed to seek to recover forward-looking common costs. The effect of both proposals, however, will be to deny the incumbent LEC any practical ability to recover its nonattributable costs.

The first method was a fixed markup: "One reasonable allocation method would be to allocate common costs using a fixed allocator, such as a percentage markup over the directly attributable forward-looking costs."[5] The practical effect of a fixed percentage markup, however, is to subsidize entrants at the expense of the incumbent LEC. If the fixed percentage produced a price exceeding the entrant's stand-alone cost, then the entrant would self-supply that particular network element rather than buy it from the incumbent LEC. (In addition, as we shall explain presently, the FCC would forbid such a price, assuming unrealistically that the incumbent LEC were so ignorant of basic economics as to attempt to charge a price so high.) If the entrant self-supplied the element, then the incumbent LEC would earn no contribution whatsoever to recovery of its unattributable forward-looking costs.

On the other hand, if the fixed percentage produced a price less than what the incumbent LEC otherwise would charge for the element (bearing in mind that the incumbent LEC in no event could price the element above its stand-alone cost), then the entrant would buy the element from the incumbent LEC rather than self-supply it. In that case, the incumbent LEC would have been forced to forgo a significant share of the overall contribution earned for its recovery of forward-looking shared costs and common costs. The shortfall in

5. *Id.* at ¶ 696.

contribution would equal the difference between (1) the element's stand-alone cost and (2) the sum of the element's TELRIC and its fixed-percentage markup over TELRIC. That shortfall to the incumbent LEC is a coerced transfer to, and subsidy for, the entrant.

The FCC's second method for allocating common costs among unbundled network elements was an example of what economists have dubbed "reverse Ramsey pricing" because of its tendency to minimize rather than maximize consumer welfare. The FCC stated:

> We conclude that a second reasonable allocation method would allocate only a relatively small share of common costs to certain critical network elements, such as the local loop and collocation, that are most difficult for entrants to replicate promptly (i.e., bottleneck facilities). Allocation of common costs on this basis ensures that the prices of network elements that are least likely to be subject to competition are not artificially inflated by a large allocation of common costs.[6]

Citing Ramsey pricing specifically, the FCC ruled that "an allocation methodology that relies exclusively on allocating common costs in inverse proportion to the sensitivity of demand for various network elements and services may not be used."[7] Despite the well recognized welfare-maximizing characteristics of Ramsey pricing principles, the FCC believed that an analogous method of allocating forward-looking shared or common costs across network elements would violate the 1996 legislation:

> We conclude that such an allocation could unreasonably limit the extent of entry into local exchange markets by allocating more costs to, and thus raising the prices of, the most critical bottleneck inputs, the demand for which tends to be relatively inelastic. Such an allocation of these costs would undermine the pro-competitive objectives of the 1996 *Act*.[8]

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6. *Id.*

7. *Id.* (citing Frank P. Ramsey, *A Contribution to the Theory of Taxation*, 37 ECON. J. 47 (1927)).

8. *Id.*

By imposing this "reverse-Ramsey" constraint on the incumbent LEC's pricing of network elements, the FCC condemned the LEC to insolvency. It is a sham for the FCC to have told incumbent LECs that they can recover their forward-looking shared or common costs only by raising the prices of their most price-sensitive network elements above TELRIC. Such a constraint ensures that the incumbent LEC will be denied the ability to recover any appreciable amount of its unattributable forward-looking costs. That constraint is tantamount to the FCC ordering every incumbent LEC to write a check to each prospective rival to help pay for its cost of entry into the local market.

### D. PROHIBITION ON PRICING ANY ELEMENT AT STAND-ALONE COST

Lest any doubt remained concerning the futility of its rules for pricing network elements, the FCC removed that doubt with its imposition of one final, fatal constraint: "In no instance should prices exceed the stand-alone cost for a specific element, *and in most cases they should be below stand-alone costs.*"[9] The first half of that sentence is superfluous. The laws of economics already prohibit a firm from charging a price exceeding stand-alone cost. The second half of the sentence, however, introduces a serious, new regulatory constraint that assures that the incumbent LEC would never be able to cover its total forward-looking costs.

After forbidding the incumbent LEC to use its pricing of unbundled loops to recover forward-looking shared costs and common costs, the FCC has taken away as well the LEC's ability to raise the price of its remaining unbundled elements to *their* stand-alone costs. Given the ability of the entrant to combine at will its own self-provision of elements with its purchase of unbundled LEC elements, the FCC has ensured that the incumbent LEC will be prevented from earning the requisite contributions from its sale of unbundled elements to recover the total forward-looking costs of its network.

Paradoxically, the FCC's pricing rules for unbundled network elements will discourage the facilities-based competition in local telephony that the 1996 legislation envisioned. It would, after all, be foolish for any entrant to build its own network from scratch when the FCC has mandated that incumbent LECs must sell unbundled network elements below their stand-alone costs, and when loops in particular must be sold to entrants at prices that may exceed TELRIC by only a scintilla.

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9. *Id.* at ¶ 698 (emphasis added).

# XIII

# Application of the FCC's Fully Distributed Cost Method for Establishing Prices for Unbundled Network Elements

As our report has demonstrated, M-ECPR prices replicate the prices that would result from voluntary exchange and, therefore, produce economically efficient outcomes. M-ECPR pricing is efficient because it exactly recovers the LEC's economic costs and, thus, satisfies the cost criterion in the *First Report and Order* that "incumbent LECs' prices for interconnection and unbundled network elements shall recover the forward-looking costs directly attributable to the specified element, as well as a reasonable allocation of forward-looking common costs."[1]

In this chapter, we apply an alternative "reasonable allocation" factor suggested by the FCC in the *First Report and Order* for assigning forward-looking common costs. This application provides a comparison between the FCC's alternative allocation factor and M-ECPR. After consideration of the FCC's alternative, which is based on a fully distributed cost allocation, we conclude that M-ECPR provides a superior method of implementing the pricing requirements in the *Act* and the *First Report and Order.*

We explicitly do not endorse the FCC's fully distributed cost method for allocating forward-looking common costs. However, even though highly flawed and inferior to M-ECPR as a pricing methodology, that method at least assigns some forward-looking common costs, unlike the Kaserman Report which merely assumes away all such common costs. Moreover, by assigning some forward-looking common costs to the prices of unbundled network elements, the

1. *First Report and Order*, at ¶ 682.

FCC's fully distributed cost allocation is also superior to the default values in the *First Report and Order* which do not even cover GTE's TELRICs.

In the *First Report and Order*, the FCC stated that "[o]ne reasonable allocation method would be to allocate common costs using a fixed allocator, such as a percentage markup over the directly attributable forward-looking costs."[2] We note that this allocation method is mathematically identical to a fully distributed cost allocation known as the "attributable cost" method.[3] The problems raised by fully distributed cost allocations have been well established in economics.[4] The fundamental problem with such prices is that, by design, they reflect only firms' costs and do not account for market demands. They are, therefore, inherently arbitrary because they do not reflect dynamic market forces, but instead follow from static cost assignment rules. Not surprisingly given their *ad hoc* nature, fully distributed cost prices can cause cross subsidization because the prices can exceed stand-alone costs.

If the FCC's "equal percentage markup" rule resulted in prices in excess of stand-alone costs, those prices presumably would be lowered so as not to violate the requirement in the *First Report and Order* that "sum of a reasonable allocation of forward-looking common costs and the total element long-run incremental cost of an element shall not exceed the stand-alone cost associated with the element."[5] However, as a result of its arbitrary nature, the equal percentage markup rule also can result in prices well below stand-alone costs and thereby prevent the recovery of forward-looking common costs.

Despite the manifold infirmities inherent in fully distributed cost-based prices, we show how to calculate the prices of unbundled network elements using the FCC's "equal percentage markup" in order to facilitate a comparison with M-ECPR prices. The attributable cost method assigns forward-looking common costs to each element according to that element's share of total TELRIC. That is, the method

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2. *First Report and Order*, at ¶ 696.

3. STEPHEN J. BROWN AND DAVID S. SIBLEY, THE THEORY OF PUBLIC UTILITY PRICING (Cambridge University Press 1986); *see also* DANIEL F. SPULBER, REGULATION AND MARKETS (MIT Press 1989) at 130. As these authors show, under certain circumstances the attributable cost method yields Aumann-Shapley prices, which are axiomatic prices for cost allocation.

4. *See, e.g.*, DANIEL F. SPULBER, REGULATION AND MARKETS (MIT Press 1989) at 133; *see also* Braeutigam, R. (1980), *An Analysis of Fully Distributed Cost Pricing in Regulated Industries*, 11 RAND JOURNAL OF ECONOMICS 182; Baumol, W., Willig, R., and Koehn, (1987), *How Arbitrary is Arbitrary, or Towards the Desired Demise of Full Cost Allocations*, 120 PUBLIC UTILITIES FORTNIGHTLY 16-21.

5. 47 C.F.R. § 51.505(c)(1), in *First Report and Order*, Appendix B, at B-30.

assigns common costs according to an element's share of attributable costs. The attributable cost method can be expressed as follows:

$$Price\ of\ Unbundled\ Element = TELRIC + (y)\ (FLCC)$$

where:

| | |
|---|---|
| *TELRIC* | = Total Element Long Run Incremental Cost; |
| *FLCC* | = Forward Looking Common Costs; and |
| *y* | = an element's share of total attributable costs (i.e., total TELRIC). |

The "equal percentage markup" rule yields an equivalent expression:

$$Price\ of\ Unbundled\ Element = TELRIC\ (1 + z/100)$$

where:

$z$ = equal percentage markup over TELRIC.

Thus, in applying the attributable cost method, the first step is to calculate the relevant TELRICs, which are shown in column (A) of Table XIII-1, and then to determine each element's share of the total TELRIC (see column (B) of the table). The next step is to multiply each element's share of total TELRIC by total forward-looking common costs (see column (C) of the table). An element's total cost allocation equals the sum of the TELRIC (column (A)) and its share of forward-looking common costs (column (C)). Alternatively, we also can calculate the equal-percentage markup over TELRIC to be applied to each element so as to achieve the same cost allocation; in this case that markup equals 56 percent, as shown in column (D) of the table.

We now examine the unbundled network element prices that result from this application of the FCC's equal percentage markup rule. GTE's loop and port prices equal the appropriate TELRICs multiplied according to the equal percentage markup rule, which yields a loop price of $36.31 and a port price of $7.04. Both these prices exceed GTE's proposed M-ECPR prices for unbundled loops and ports. This occurs as a result of the fact that the equal percentage markup rates exceed the cost of entrant's best available market alternatives. As noted, this can occur because fully distributed cost-based rates can exceed entrants' stand-alone costs, in violation of the requirement in the *First Report and Order* that unbundled network element prices not exceed stand-alone costs. As noted, the equal percentage markup rates for GTE's loops and ports presumably would be reduced to the level of the respective stand-alone costs.

In contrast, the equal percentage markup prices for GTE's unbundled switching services are less than GTE's proposed rates, which equal its effective rates for these rate elements. In this case, the FCC's method would prevent the recovery of forward-looking common costs from services with prices at or below stand-alone costs. Thus, the equal percentage markup rule penalizes GTE by lowering prices on services where its rates do not exceed entrants' stand-alone costs.

In sum, application of the FCC's equal percentage markup rule yields prices that will not enable GTE to recover its forward-looking common costs. Thus, even assuming, *arguendo*, that equal percentage markup prices were found acceptable, they would still necessitate a competitively neutral end-user charge so that the FCC's cost recovery mandate (i.e., that prices for unbundled network elements should recover the relevant TELRIC plus a reasonable share of forward-looking common costs) would be met.

TABLE XIII-1
FIXED ALLOCATOR OR ATTRIBUTABLE COST METHOD

| Unbundled Network Element | (A) Long Run Incremental Cost ($ Million/year) | (B) Share of Total Long Run Incremental Costs[4] | (C) Reasonable Share of Forward-Looking Common Costs[5] ($ Million/year) | (D) Equal Percentage Mark-Up Over Total Element Long Run Incremental Cost (%)[6] |
|---|---|---|---|---|
| Loops | 416.1 | 0.674 | 233.4 | 56 |
| Local Switching | 193.0 | 0.312 | 108.0 | 56 |
| Tandem Switching | 1.1 | 0.002 | 0.7 | 56 |
| Transport[1] | 7.5 | 0.012 | 4.2 | 56 |
| Other[2] | 0.0 | 0.000 | 0.0 | 56 |
| Total | 617.7 [3] | 1.000 | 346.3 | 56 |

Notes:
1/ Includes dedicated transmission links and common/shared facilities.
2/ Includes databases and signaling systems, collocation, operator services, directory assistance, and subscriber numbers.
3/ This total TELRIC is net of "other" costs.
4/ Equals Column A divided by the sum of total element long-run incremental costs.
5/ Equals Column B multiplied by the total forward-looking common costs.
6/ Equals [(forward-looking total costs/forward-looking incremental costs) - 1] x 100.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF DENNIS B. TRIMBLE**

**DOCKET NO. 960847-TP**

**Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND TITLE.**

A. My name is Dennis B. Trimble. My business address is 600 Hidden Ridge Drive, Irving, Texas, 75015. I am employed by GTE Telephone Operations as Assistant Vice President - Marketing Services (Acting) and am representing GTE or "the Company" in this arbitration proceeding with AT&T.

**Q. WILL YOU PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND WORK EXPERIENCE?**

A. I received a B.A. in Business in 1970 and an M.B.A. in 1973, both from Washington State University. In 1972, I became an Assistant Professor at the University of Idaho, where I taught undergraduate courses in statistics, operations research and decision theory. From 1973 through 1976, I completed course work towards a Ph.D. degree in Business at the University of Washington, majoring in quantitative methods with minors in computer science, research methods, and economics. I began my career with GTE in 1976 as an Administrator - Pricing Research with General Telephone Company of the Northwest ("GTENW"). Through 1985, I held various jobs with GTENW and GTE Service Corporation, almost all related to demand analysis, market

research, and/or strategic planning. In 1985, I was named Director - Market Planning for GTE Florida, Incorporated ("GTEFL") and in 1987, I became GTEFL's Director - Network Services Management. During most of 1988 and early 1989, I was also Acting Vice President - Marketing for GTEFL. From 1989 through most of 1994, I was employed by GTE Telephone Operations as Director - Demand Analysis and Forecasting. In October of 1994, I became Director - Pricing and Tariffs for GTE Telephone Operations and assumed the additional responsibilities of the Assistant Vice President - Marketing Services position in August, 1995.

**Q. HAVE YOU PREVIOUSLY TESTIFIED ON BEHALF OF GTE?**

A. Yes. I have presented testimony on behalf of GTE before the California Public Utilities Commission, the Florida Public Service Commission and the Hawaii Public Utilities Commission.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THE DOCKET?**

A. In response to AT&T's request for arbitration filed with this Commission, I will be sponsoring GTE's cost studies for:

(1) unbundled network elements and associated ordering/provisioning non-recurring charges ("NRC"s),

(2) interconnection elements,

(3) collocation elements, and

(4) service provider number portability ("SPNP") [SPNP is also know in the industry as interim number portability ("INP").]. I will also address GTE's proposed pricing for each category of elements. The economic rationale supporting the pricing policies employed by GTE in the development of its proposed rates for unbundled network elements is the subject of the Economic Presentation in this proceeding.

**Q. PLEASE DESCRIBE THE MAJOR UNBUNDLED ELEMENTS GTE PROPOSES AND HOW THEY CAN BE USEFULLY COMBINED WITH THE ALTERNATIVE LOCAL EXCHANGE CARRIERS ("ALECS") SELF-PROVISIONED NETWORKS AND SERVICES TO DELIVER COMPETITIVE LOCAL EXCHANGE SERVICE.**

A. GTE's major proposed unbundled services are:

- Unbundled Loops. The unbundled loop provides a voice-grade path between an end user and a GTE wire center. An ALEC may obtain this loop from GTE and connect it to a cross connect available at the end office through a collocation arrangement. The ALEC could self-provision the transport facilities from GTE's end office to the ALEC's own switching center. In such an arrangement the ALEC would provide, through its own

switch, all related switching services such as local usage, custom calling services, switched access service (both originating and terminating), and toll services. Today, most of these are high-margin services which provide GTE with significant contributions (revenues minus costs) to cover its common costs and overheads, thus enabling GTE to support the level of investment infrastructure necessary to operate as a carrier of last resort ("COLR") and achieve the Commission's public policy objectives (e.g., universal service).

GTE is also offering loop conditioning services for unbundled loops that assure that desired loops have the technical capability to handle enhanced end user services (e.g., ISDN, switch data).

- Unbundled Port. The unbundled port provides access to switching services from a GTE switch to be used with an ALEC-provided loop. This element would apply in areas where ALECs have loop facilities but do not have a local switching center in service. In this situation, the ALEC will cross connect its loop with GTE's switch through a collocation arrangement. Through the port, the ALEC can obtain access to both the local switching capability of GTE's switch (e.g., local calling, switch features) and the

capability to route calls from the trunk side of the switch (e.g., switched access, toll service, E-911 service, directory service, etc.). The functionality of the switch (e.g., local calling, switch features) will be purchased from GTE at its resale rates.

- Network Access Cross Connection ("NACC"). The NACCs are used to facilitate the physical delivery of a loop from GTE's main distribution frame to the ALEC's collocated facilities. GTE has elected to combine the NACC with the local cross connect facility (since they are always used together) and refer to this joint facility as a network access cross connection [NACC is also referred to as Expanded Interconnection Service Cross Connect ("EISCC").].

- SS7 Interconnection. SS7 interconnection allows an ALEC to connect to GTE's SS7 network at a Signal Transfer Point ("STP"). This connection enables ALECs to exchange SS7 messages without providing the underlying SS7 network. It also provides access to database services (e.g., Database 800 Carrier Selection Service and Line Information Database ("LIDB")). This interconnection will also support efficient call setup and delivery of SmartCall™ services without first connecting to a GTE switch. Because there is such a vast array of possible services provided

with SS7 interconnection, the Company proposes that interconnection arrangements be provided subject to negotiated contracts. With negotiated contracts, agreements can be customized to meet the specific SS7 requirements of each ALEC. These contracts would reference the signal links and STP ports currently tariffed in the GTOC Tariff FCC No. 1.

## COST STUDIES

### A. UNBUNDLED NETWORK ELEMENTS

**Q. WHAT COSTING PRINCIPLES DID GTE EMPLOY IN DEVELOPING ITS TOTAL ELEMENT LONG-RUN INCREMENTAL COST ("TELRIC") STUDIES?**

A. Exhibit No. DBT-1 to this testimony contains a complete description of the costing principles used by GTE to develop its TELRIC estimates for unbundled network services (Tab 1 of "GTE's Cost Submission" in this proceeding also contains the discussion on GTE's costing methods and models.).

**Q. WHAT COST STUDIES HAS GTE FILED IN THIS PROCEEDING?**

A. GTE's Cost Study Submission contains TELRIC estimates for certain "network elements" as well as Total Service Long-Run Incremental Cost ("TSLRIC") estimates for select bundled "services." The Company has provided TELRIC estimates for the

following elements:

- Network Interface Device ("NID"): Basic and 12X
- Loops: 2-wire and 4-wire
- Local Switching
  - Ports: 2-wire analog and DS-1
  - End Office Switching: Originating and Terminating
- Tandem Switching
- SS7 Signal Links: 56kb and DS-1
- SS7 Signal Transfer Point ports
- Transport: Common and Dedicated

Collocation element costs studies were also provided for:

- Network Access Cross Connection: DS-0, DS-1, and DS-3 levels
- Physical Engineering Fee
- Building Modification Charges
- Partitioned Space Rental
- DC Power
- Cable Space Charges.

Service Provider Number Portability cost studies:

- Remote Call Forwarding per number ported
- Simultaneous Call paths

In addition, TSLRIC studies were performed and submitted for other services that the Company offers (e.g., basic local service, vertical services, toll, and switched access). These studies were a component to the derivation of the Company's total "forward-looking" costs for all its services. This total cost estimate helped the Company to estimate its "forward-looking" common costs.

GTE's Cost Study Submission also includes its "Avoided Cost Study" analysis which is a primary component of its recommended resale rates. This study and the resulting recommended price levels for resold services is the topic of GTE's Resale/Avoided Cost Presentation.

**Q. AT&T ASSERTS THAT GTE'S "COMMON" COSTS ARE EITHER NONEXISTENT OR DE MINIMIS. DO YOU AGREE WITH AT&T'S ASSERTION?**

A. No. As shown in Exhibit No. DBT-2, the annual common costs for GTE's operations in this state exceed **$ **million, which translates to about ** %** of GTE's total revenues. AT&T's proposal does not allow for recovery of these costs.

## B. NON-RECURRING CHARGES

**Q. HAS GTE IDENTIFIED THE COST OF SERVICE ORDERING AND SERVICE CONNECTION ACTIVITIES REQUIRED IN CONNECTION**

**WITH THE OFFERING OF WHOLESALE SERVICES?**

A. Yes. GTE has included in its Cost Submission package (Tab 9) a study for wholesale service ordering and service connection activities ("the NRC study").

**Q. PLEASE DESCRIBE THE PURPOSE OF GTE'S NRC STUDY.**

A. The purpose of the NRC study was to determine the non-recurring costs of service ordering and service connection activities required to provide wholesale services using a newly-developed wholesale service provisioning process. The study was designed to determine these costs for four wholesale service provisioning functions: unbundled loop, unbundled port, resale, and service provider number portability.

Because the wholesale provisioning process has not yet been established, the time and motion studies typically used to collect actual study data were not available. Instead, the study was conducted based on a planning model developed by the GTE Telephone Operations Open Market Transition ("OMT") Team.

**Q. PLEASE DESCRIBE THE OMT TEAM'S PLANNING EFFORTS.**

A. A variety of subteams comprised the OMT team. The Business Process and Systems Support subteam was charged with designing the processes needed for GTE to offer unbundled network elements and resale services, both on an interim and a

long-term basis. These processes included ordering, provisioning, installation, maintenance, repair, and billing.

**Q. WHY ARE THESE PROCESSES DIFFERENT FROM GTE'S EXISTING RETAIL PROCESSES?**

A. Fundamentally, these processes differ from GTE's existing retail processes because GTE is serving a different customer set -- ALECs rather than individual end user customers. The presence of an intermediary ALEC changes systems and procedures designed to serve end users.

First, GTE is required to obtain and maintain a different and new set of account level data with respect to its customer, the ALEC, versus its end user customer, e.g., record of a valid Certificate of Public Convenience and Necessity ("CPCN"), billing arrangements, contact persons, etc.

Second, processes and procedures for coordinating end user customer information with the ALEC must be established to meet GTE's requirements necessary to enable installation, repair and other aspects of service.

Third, GTE must maintain multiple accounts per ALEC end user customer, rather than the single account maintained per GTE customer. This will include the ALEC account, an end user

account for peripheral processes which cannot be handed over completely to the ALEC (e.g., E-911 data entry, maintenance, and repair), and a residual account for any retained GTE services (e.g., casual intraLATA and interLATA billing, directory advertising, voicemail, etc.). GTE must also modify its billing procedures to render individual account level detail as well as a summary bill to the ALEC.

Finally, GTE must train all of its personnel in the new procedures and ensure that the systems will function smoothly in a resale as well as a retail environment.

**Q. HOW DID THE BUSINESS PROCESS AND SYSTEMS SUPPORT SUBTEAM GO ABOUT DESIGNING THESE NEW PROCESSES?**

A. The subteam was composed of 35 to 40 individuals from the functions and departments within GTE which would be affected by the new processes. These included subject matter experts from each of GTE's three lines of business--consumer, business and carrier--as well as network operations (engineered and non-engineered provisioning, installation, dispatch, and repair), database administration, billing and training functions. These individuals developed scenarios for the ordering, repair, maintenance and billing functions which would be needed in the resale environment, determined the need for additional or modified

systems and functions, and developed and analyzed process flows for all scenarios.

The subteam determined which workgroups would be impacted by the new processes, and developed estimated work times for each function identified in the process flows. Based on forecasted volumes of service orders, the subteam then allocated these forecasted volumes to the different workgroups to essentially develop a model worktime analysis of the functions and systems involved as part of the newly designed processes.

**Q. WHAT FUNDAMENTAL INFORMATION WAS USED FROM THE SUBTEAM'S ANALYSIS IN THE DEVELOPMENT OF THE NRC STUDY?**

A. Two fundamental sets of information were taken from the subteam's analysis. First, the analysis defined all of the work activities necessary for GTE to respond to all four types of Local Service Requests ("LSR"s) examined in the NRC study: new service, account change - GTE to ALEC, account change - ALEC to ALEC, and service change. Work times developed by the subteam were used in the NRC study to determine costs for all relevant work activities.

Second, because not all LSRs require all of the possible work activities, the analysis established assumptions regarding the

frequency of the need for each work activity. For example, the summary bill master order activity was assumed to be required on 5% of all LSRs.

These data from the subteam's analysis were used in estimating the costs of ordering and provisioning in the prospective wholesale service environment. In addition, planning assumptions underlying the subteam's analysis were carried forward through the NRC study.

**Q. HOW WAS THE NRC STUDY PREPARED?**

A. Service ordering and service connection activities were studied separately for each of the four wholesale provisioning functions I identified earlier; for the unbundled loop and unbundled port functions, four different types of LSRs were studied separately. For each type of LSR, work times for all relevant work activities were priced out at loaded labor rates, and activity costs were determined based on the frequency assumptions for each work activity. Total costs for the LSRs were calculated by summing the activity costs.

**Q. BASED ON GTE'S ANALYSIS OF NON-RECURRING COSTS, WHAT WHOLESALE NRCS ARE YOU PROPOSING?**

A. In general, charges have been designed to recover separately the costs of service ordering and installation activities, recognizing to

the extent possible any like functions required for various types of LSR activity. By structuring the NRCs in this way, common charges are established that apply to all types of ordering activities, simplifying administrative processes for both the Company and the ALECs.

The proposed NRC structure reflects the remaining differences in anticipated costs for various types of ordering activities, and enables a reasonable relationship between the service connection charges and the incurred costs of associated work functions on an order-by-order basis.

Service ordering and installation charges are proposed both for unbundled services and resale services.

**Q. HOW WERE THE SERVICE ORDERING CHARGES FOR UNBUNDLED SERVICES DESIGNED?**

A. These NRCs were designed to recover the costs of work functions listed in the NRC study under the heading "National Open Market Center" on a per-order basis. The Initial Service Order charge is based on the costs for the install, summary bill master, disconnect and all other ordering functions, plus system processing.

Separate charges are proposed for a Transfer of Service and for a Customer Service Record Search. The Transfer of Service charge will be administered as required by the type of LSR; a transfer of service charge is required on any change in service from GTE to an ALEC where GTE must continue end user billing on the account, for CPE or directory advertising, for example.

Customer service record research is performed at the request of the ALEC to obtain a summary of the services subscribed to by the end user. The Customer Service Record Research charge will be administered whenever account information is requested.

The Subsequent Service Order charge will be applied on LSRs requesting a service change on an existing account, and is designed to recover the costs of work functions listed in the NRC study under the heading "National Open Market Center" on a per-order basis for all service change requests.

**Q. HOW WERE THE INSTALLATION CHARGES FOR UNBUNDLED SERVICES DESIGNED?**

A. Installation NRCs were designed to recover the costs of work functions listed in the NRC study under the headings "SSCC", "FAC", "DAC" and "CZT". A separate Loop Facility Charge for outside facilities work by customer zone technicians will be administered when such work is required to complete LSRs for

unbundled loop services. The balance of the installation costs are recovered through installation charges on a per-line or per-port basis. These NRCs were developed using the assumption from the OMT subteam's analysis that an unbundled service order will contain, on average, five lines or ports. That is, installation costs were divided by five to develop the per-line or per-port installation NRC.

**Q. HOW WERE THE NRCS FOR RESALE ORDERING AND INSTALLATION ACTIVITIES DESIGNED?**

A. These charges were designed in essentially the same manner described for unbundled services. The installation charge was developed using the assumption from the OMT subteam's analysis that a resale order will contain, on average, three lines. That is, installation costs identified in the NRC study were divided by three to develop the installation NRC for resale services.

**Q. WOULD YOU PLEASE EXPLAIN THE CIRCUMSTANCES WHICH WOULD CALL FOR APPLICATION OF THE PROPOSED RESALE NRCS?**

A. Yes. There are two resale scenarios, which I will refer to as "new" and "conversion". A "new" resale service is one for an end user who establishes service within a GTE local service area, but chooses an ALEC reseller for local service. A "conversion"

represents the loss of an existing GTE retail end user to an ALEC reseller.

Since the anticipated GTE ordering activities required to complete the associated LSRs are the same, and since the installation charges will be applied only when the installation work is required (e.g., for "new" services) there was no need to distinguish between these two cases in the NRC study, nor in the proposed NRC structure.

## PRICING

### A. NON-RECURRING CHARGES

**Q. WHAT NRC RATES IS GTE PROPOSING TO THE ALECS FOR SERVICE ACTIVITIES?**

A. GTE's proposed rate structure and rate levels for NRCs are presented in Exhibit No. DBT-3.

### B. UNBUNDLED NETWORK ELEMENTS

**Q. WHAT RATES IS THE COMPANY PROPOSING FOR UNBUNDLED NETWORK ELEMENTS?**

A. Exhibit No. DBT-3 also presents GTE's proposed rates for the various unbundled elements (Although the elements identified in Exhibit No. DBT-3 are priced as though they are unbundled

elements, GTE does not believe that all the elements in Exhibit No. DBT-3 are "network elements" under the Act.).

**Q. ARE THE RATE "STRUCTURES" THE COMPANY PROPOSES FOR THE DESCRIBED UNBUNDLED NETWORK ELEMENTS CONSISTENT WITH THE GUIDELINES PRESENTED IN THE FCC'S FIRST REPORT AND ORDER?**

A. Based on my understanding of the First Report and Order, there are three areas in which GTE's proposal is currently inconsistent with the FCC's Order concerning unbundled network elements:

(1) GTE is not proposing to establish (at this time) different rates for elements in at least three defined geographic areas to reflect cost differences (Section 51.507(f)). It would be premature to deaverage wholesale rates without also being able to deaverage retail rates -- these rates must be consistent with each other and move together.

(2) GTE has not proposed a Local Switching Capability element (Section 51.319(c)).

(3) GTE has not developed nor proposed rates for unbundled Operations Support Systems ("OSS") functions (Section 51.319(f)).

**Q. WHAT IS THE BASIS UPON WHICH THESE UNBUNDLED NETWORK ELEMENT RATES WERE DEVELOPED?**

A. The procedure employed by the Company along with the economic (and practical) rationale supporting the procedure are the topic of Company's Economic Presentation in this proceeding. Based on the procedures prescribed in the Economic Presentation, the development of the specific rates for each element presented above will be described in the following testimony

1. Unbundled Loops

The basic unbundled loop was priced at GTE's estimate of its Stand Alone Cost ("SAC"). This $33.08 estimate was not only supported by GTE's Cost Study Submission but also by GTE's analysis of the Benchmark Cost Model - Version II ("BCM II") [The following companies have taken an active role in sponsoring BCM: Sprint, MCI, US West, and NYNEX. See "Benchmark Cost Model," submitted to the FCC, CC Docket No. 80-286, September 12, 1995. BCM II development has been led by Sprint and US West.] which provided another independent estimate of GTE's TELRIC for unbundled loops [The unbundled loop cost estimates resulting from the use of BCM II are presented in Tab 21 of GTE's Cost Study Submission.].

2. Unbundled Ports

The basic ports were priced at GTE's estimates of the TELRIC for each element plus a minimal amount of contribution to the Company's common costs (approximately 10%).

3. Unbundled Cross Connects

These elements were also priced at GTE's estimates of the TELRIC for each element plus an incremental amount of contribution.

4. Transport, Multiplexing and SS-7 Services

All of these network elements were priced at existing Facility for Intrastate or Facility for Interstate Access Tariff rates, as appropriate.

**Q. YOU MENTIONED THAT YOU HAVE BASED YOUR PRICING OF UNBUNDLED LOOPS ON THE METHOD DESCRIBED IN THE ECONOMIC PRESENTATION MATERIAL AND GTE'S ESTIMATE OF STAND-ALONE COSTS. COULD YOU EXPLAIN HOW YOU UTILIZED THIS METHOD TO DEVELOP YOUR PROPOSED RATE LEVELS?**

A. As discussed in the Economic Presentation and supported by this testimony, GTE's proposed rate levels utilize the TELRIC of the network element as a price floor. By using the methods described

in the Economic Presentation, I arrived at a "reasonable allocation of forward-looking common costs" to be added to each element's TELRIC to determine GTE's proposed price level.

**Q. HOW HAVE YOU EVALUATED THE REASONABLENESS OF THE COMMON COSTS RECOVERED IN YOUR UNBUNDLED LOOP RATES?**

A. In addition to the pricing rules described in GTE's Economic Presentation, I utilized three basic criteria to assure myself of the overall reasonableness of GTE's proposed unbundled loop rates. These are:

(1) an evaluation of the relationship of GTE's unbundled loop TELRICs to their respective Interstate special access (special access is a "functionally" equivalent service to an unbundled loop) rates;

(2) the overall (looking at all services, both wholesale and retail) GTE average percentage contribution levels, above direct cost (I am defining direct cost here as TELRIC and/or TSLRIC), required to achieve full recovery of the Company's forward-looking common costs; and

(3) the "upper bound" loop price presented in the Economic Presentation.

**Q. PLEASE EXPLAIN YOUR APPLICATION OF THE ECONOMIC PRESENTATION'S "UPPER BOUND" LOOP PRICE.**

A. The "upper bound" loop price can be considered a price level that just preserves GTE's overall levels of contribution to common costs. If GTE were to propose an unbundled loop price above the "upper bound", it would theoretically be making more revenue contributions (and thus, potentially net income), than it does without the introduction of unbundled loops. Thus, GTE's pricing proposals for unbundled loops have a constrained ceiling, even if the "upper bound" price is below GTE's estimate of entrants' "Stand Alone Costs" for unbundled loops.

**Q. WHY DID YOU RELY ON AN EVALUATION OF THE INTERSTATE SPECIAL ACCESS RATES IN DETERMINING THE REASONABLENESS OF THE COMMON COSTS RECOVERED IN YOUR UNBUNDLED LOOP RATES?**

A. Special access elements (i.e., two-wire and four-wire special access/entrance facilities) are functionally equivalent to basic unbundled loops. I reviewed GTE's interstate rates to determine their appropriateness as a benchmark for GTE's unbundled loop rates. When this evaluation indicated that the interstate rate for a 2-wire facility was reasonable (above its TELRIC with some contribution to common costs and also below the estimate of "upper-bound" ceiling price), the current two-wire Interstate

Entrance Facility rate was proposed for the two-wire unbundled loop.

**Q. IN THOSE CASES WHERE THE TELRIC EXCEEDED THE CURRENT INTERSTATE ENTRANCE FACILITY RATE, HOW DID YOU DETERMINE THE REASONABLENESS OF THE COMMON COSTS RECOVERED IN YOUR UNBUNDLED LOOP RATES?**

A. When the current Interstate Entrance Facility rate was not a good indicator (i.e., below cost), the company relied on the TELRIC as a price floor and the "upper-bound" price as a ceiling for the unbundled loop rate. That is, if the TELRIC was above the current Interstate Entrance Facility rate, then this rate could not be a good indicator of the economic costs of the unbundled loop element. In those cases, the Company determined a mark-up to provide a reasonable contribution to common costs. The proposed rate in this instance provides minimal contribution when compared to the rate required to recover an equal percentage mark-up. Again, in no case do I propose a rate for an unbundled loop that I consider to be above the SAC of an unbundled loop.

**Q. PLEASE EXPLAIN WHY YOU COMPARED GTE'S PROPOSED UNBUNDLED LOOP RATES TO A RATE DERIVED FROM AN "EQUAL PERCENTAGE MARK-UP" CALCULATION.**

A. The FCC in its First Report and Order at paragraph 696 concluded that "... one reasonable allocation method would be to allocate

common costs using a fixed allocator, such as a percentage markup over the directly attributable forward looking cost." Although GTE disagrees with this methodology, we wanted to check our results against the FCC's proposal.

**Q. HOW DID GTE COMPUTE ITS EQUAL PERCENTAGE (FIXED ALLOCATOR) MARK-UP RATE AS ADVOCATED BY THE FCC, AND HOW DO THESE RESULTS COMPARE WITH THE COMPANY'S METHODOLOGY?**

A. As described in GTE's Economic Presentation, GTE computed the percentage that its total directly attributable forward-looking costs (i.e., TELRIC and TSLRIC) are of its total economic costs. This computation was performed using the data presented in Exhibit No. DBT-2 and resulted in a fixed allocator of ** %**; thus, the FCC would imply that one reasonable allocation of common costs for GTE would be to mark-up all services and network elements by ** %**, (price = TELRIC*(1 + Fixed Allocator)). The comparative results of this evaluation are presented in Exhibit No. DBT-3. As can be seen in Exhibit No. DBT-3, GTE's proposed 2-wire and 4-wire unbundled loop rates are all below the rates resulting from the FCC's fixed allocator procedure. But even though the FCC's methodology would result in higher rates for GTE than GTE's methodology, GTE does not advocate adoption of the FCC's methodology.

**Q. WHAT PERCENT MARGIN CONTRIBUTION WILL GTE BE MAKING FROM ITS PROPOSED RATES FOR UNBUNDLED LOOPS?**

A. Based on an average unbundled loop cost of **$ **, GTE will achieve an approximate ** %** margin above cost with its proposed $33.08 unbundled loop rate. We believe this is a reasonable contribution to the Company's common costs, since on the average, across all product offerings GTE must achieve an average ** %** margin above all TELRICs (directly attributable forward looking costs) to fully recover its "forward-looking" common costs.

**Q. COULD GTE'S PROPOSED RATES FOR UNBUNDLED NETWORK ELEMENTS BE CONSIDERED "MAKE-WHOLE" RATES?**

A. Absolutely not. The major contributor to this "not-make-whole" situation is GTE's proposed unbundled 2-wire loop price of $33.08. As presented in GTE's Economic Presentation material, the upper bound price (contribution preserving price) for an average business unbundled loop would be **$ **. The difference between the **$ ** and GTE's proposed rate of $33.08 represents a permanent loss of contributions to the Company; **$ ** "on the average" will be lost for every unbundled loop provisioned to an ALEC's business customers. If ALECs target business customers with above average usage characteristics, the losses in contributions that the Company will experience will greatly exceed **$ ** per unbundled loop.

As can be seen from Exhibit No. DBT-3, this loss of contributions results from the loss of high margin services (toll, switched access, and vertical services) that will certainly be lost when an ALEC provides a GTE unbundled loop to a business customer. Exhibit No. DBT-4 presents similar data for GTE's average residential customers and presents the computed rates that GTE would be required to charge if it were to be made whole (**$ ** for business, **$ ** for residence, or **$ ** for an "average" unbundled loop), ignoring market realities. GTE's proposed unbundled loop rate of $33.08 is substantially lower than any make-whole rate.

It should be noted that the "upper bound" loop rate of **$ ** is the result of many decades of pricing services based on their perceived "value of service" along with the complementary outcome that revenue contributions from business customers should be used to keep residential rates low. GTE's current rate structure, as mandated by regulation, continues to provide incentives for the inefficient entry of competitors whose major objective will be to capture the above-market contributions that are used by the Company to support public policy objectives. ALECs will use these captured contributions to finance their entry into the local market.

**Q. ASSUMING THE COMMISSION ACCEPTS GTE'S PROPOSED UNBUNDLED LOOP RATE, WILL SUCH A RATE PROVIDE REVENUE AND CONTRIBUTION OPPORTUNITIES FOR ALECS TO EFFECTIVELY COMPETE WITH GTE?**

A. Yes, and the ALECs do not have to be as efficient as GTE for this to occur. Equally efficient entrants would be just as incented to enter the marketplace if GTE's unbundled loop rate were proposed at its "upper bound" loop price; but market conditions preclude this rate from being proposed. As illustrated in Exhibit No. DBT-4, the financial opportunities available to ALECs, in terms of their ability to earn additional contributions to their common costs and overheads, would equal the difference between any revenues GTE would have received from the end users (assuming the ALECs match GTE's retail rates) less the rate of GTE's unbundled loop and any self-provisioned elements.

At a $33.08 unbundled loop rate, ALECs should be highly motivated to attract GTE's business customers, whose revenue streams exceed **$ **. For illustrative purposes let's assume that AT&T obtains 10 percent of GTE's end user customers through the use of GTE's unbundled loop. Under this scenario, the annual revenue contributions available to AT&T, assuming its price and cost structures mirror GTE's, would be over **$ **million per year as shown in Exhibit No. DBT-4.

To look at it another way, GTE (on the average for combined business and residence lines) obtains approximately **$ ** contribution per month (The total contribution levels are presented in Exhibit No. DBT-4.); which provides for recovery of the Company's forward-looking common costs. From Exhibit No. DBT-4, one can compute that an equally-efficient ALEC (which we will assume AT&T is) should be able to generate approximately **$ ** in contribution from an average business customer. Actual contribution levels for ALECs should be larger since they are not likely to be targeting an average business customer, but more likely will be targeting high-volume business customers. In addition, by purchasing GTE's unbundled loop, ALECs will most likely not have any of the common costs that result from the provision of loops, thus it is likely that their level of common costs will be significantly below GTE's average per line amount (**$ **). Of course the ALECs' contribution gains are also GTE's contribution losses.

## C. LOCAL INTERCONNECTION

**Q. WHAT RATE LEVEL DOES GTE PROPOSE FOR THE TERMINATION OF LOCAL TRAFFIC?**

A. Compensation for termination of local traffic should be based on cost plus a reasonable contribution. However, GTE is willing to negotiate a bill-and-keep arrangement, in the interest of expediting

the competitive process, with a mutual compensation provision if the traffic becomes "out-of-balance." GTE proposes to charge its intrastate switched access rates for all minutes terminated to GTE that exceed a "threshold of balanced traffic."

**Q. WHY DO YOU BELIEVE THAT GTE'S CURRENT TARIFF RATES FOR INTRASTATE SWITCHED ACCESS ARE REASONABLE RATE LEVELS FOR LOCAL INTERCONNECTION?**

A. Intrastate switched access rates are rates that represent our current wholesale offering to interexchange carriers ("IXC"). GTE has no desire to continually introduce new rate levels that vary by "class of wholesale customer" (e.g., ALEC versus IXC, etc). The current switched access rates have been blessed by the Commission as appropriate rates for wholesale switching elements, and with GTE's "bill-and-keep" proposal, these proposed rates would not be effective until traffic becomes "out-of-balance". The arbitration process must be cognizant of the impacts that the "arbitration decision" will have on GTE's entire non-ALEC product offerings (i.e., decisions in this proceeding should not exacerbate nor accelerate the arbitraging of GTE's existing tariffs).

**Q. DO MUTUAL COMPENSATION AGREEMENTS CREATE ANY ADDITIONAL RATEMAKING ISSUES?**

A. Yes. Traditionally, in instances where GTE has paid other Local

Exchange Carrier ("LEC"s) to terminate GTE-originated traffic, rate structures have been available that allowed GTE to recover those costs by levying charges to end users. Toll charges and Extended Area Service ("EAS") adders are examples of such rate structures. Historically, when GTE did not have a mechanism to levy charges to end users, GTE did not pay for the termination of its traffic. With mutual compensation, GTE's expenses will increase. Recovery of such costs will necessitate a rate structure that allows charges to end users (the "cost-causer") for originating such traffic. Incumbent LECs, as well as all other telecommunications providers, should have the option of implementing such end user charges. This may require charging all end users for all originating traffic (perhaps with a provision for the terminating customer to accept such charges).

## D. SERVICE PROVIDER NUMBER PORTABILITY

**Q. WHAT RATES ARE GTE PROPOSING FOR SPNP?**

A. GTE's proposed rates for SPNP can be found in Exhibit No. DBT-3. The rate structure proposed by GTE includes a price per remote call number and a price per call path. Thus, each telephone number requested to be ported will pay the sum of the two charges. If an end user desires additional simultaneous call paths, then the per call path price applies to each requested simultaneous path. The prices for both of these rate elements

were set at GTE's TELRIC estimates with an approximate 10% contribution to common cost.

## FCC's PROXY RATES

### A. LOCAL SWITCHING ELEMENT

**Q. THE FCC PROPOSED A RATE PROXY OF $.002 - $.004 FOR BOTH TERMINATION OF LOCAL TRAFFIC AND A LOCAL SWITCHING CAPABILITY ELEMENT. YOU HAVE PROPOSED GTE'S INTRASTATE SWITCHED ACCESS RATES FOR TERMINATING LOCAL TRAFFIC ON THE GTE NETWORK. WOULD INTRASTATE SWITCHED ACCESS RATES ALSO BE APPLICABLE FOR THE LOCAL SWITCHING CAPABILITY ELEMENT?**

A. Absolutely not. First, GTE does not agree that local switching capability is a network element. And even if it were, the FCC's proposed proxy rate of $0.002 - $0.004 per minute would be inappropriate.

From review of testimony in Illinois and California proceedings, it appears that ALECs believe that the FCC's local switching capability element includes all of the switch's functionality, including line and trunk side ports, switching fabric, vertical

features and functions, and customized routing capabilities. If this is the case, the $0.002 - $0.004 rate is clearly inadequate.

GTE's TELRIC studies generate a cost for end office switching that is about **$ **. But this cost is applicable only to the switch fabric function alone, and does not reflect the costs of line or trunk side ports, vertical features and functions or customized routing capabilities. Also, there would be additional costs associated with developing appropriate systems and procedures to allow ordering, provisioning, administration and billing of the Local Switching Capability element since this element is not offered on either a wholesale or retail basis by GTE.

If GTE were to integrate all of the vertical features that its switches could provide into a "you get them all with switching" package, GTE's required price per minute of use would be astronomical. If each port came with a full complement of vertical services, the full TELRIC cost of the "free" vertical services could easily exceed $100 per month (see Tab 23 of GTE Cost Study Submission for the TELRICs of most vertical services), which could never be recovered with a $0.004 per minute of use switching charge. Even for a reasonable level of vertical services, prices for a local switching network element would have to be in the $0.03 to $0.05+ per minute range for the Company to recover its forward-looking costs.

## B. UNBUNDLED LOOP PROXY RATES

**Q. SHOULD THE FCC'S PROPOSED LOOP PROXY RATES , AS PUBLISHED IN ITS FIRST REPORT AND ORDER) PLAY ANY PART IN THE NEGOTIATION PROCEEDING?**

A. No. The FCC's proposed proxies have no relationship to reality. For this state, the FCC's unbundled loop proxy price is $13.68. But GTE's 2-wire unbundled loop TELRIC is **$ **. A simple comparison of these two numbers illustrates that the FCC's proxy rate is significantly understated. Similarly, the FCC's price is also significantly understated when compared with the BCM II produced TELRIC [See Tab 21 of GTE's Cost Study Submission.] (** $ **).

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

A. Yes.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF RODNEY LANGLEY**

**DOCKET NO. 960847-TP**

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

A. My name is Rodney Langley. My business address is 600 Hidden Ridge, Irving, TX, 75038.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by GTE Telephone Operations as a Senior Product Manager.

**Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATION AND WORK EXPERIENCE.**

A. I hold a B.S.-B.A degree from Valdosta State University in Georgia. I have been employed by GTE for 24 years, having carried out responsibilities in switch administration, the business office, access services and product manager.

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

A. I will discuss the open issues between GTE and AT&T with respect to AT&T's requests for access to GTE's operations support systems (OSS). I will first provide a general overview of operations support systems, then set out the relevant requirements under the

Telecommunications Act of 1996 (Act) and the FCC's associated Order. I will next list the disputed issues presented for arbitration and summarize each parties' position. Finally, I will explain in detail GTE's position on the issues.

**Q. BY WAY OF INTRODUCTION, CAN YOU DESCRIBE THE NATURE OF THE DISPUTE BETWEEN GTE AND AT&T OVER OPERATIONS SUPPORT SYSTEMS ("OSS")?**

A. Yes. Under the Telecommunications Act of 1996 (the "Act"), alternative local exchange carriers ("ALECs") who request interconnection with the networks of incumbent local exchange carriers ("ILECs") are to be given access to network elements on an unbundled basis. (Act at § 251(c)(3).) This unbundling is to be provided at technically feasible points at rates, terms and conditions that are just, reasonable, and nondiscriminatory. (Act at 251(c)(3).) An ILEC's operations support systems functions are one of the unbundled elements subject to these requirements. (Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, First Report and Order, CC Docket 96-98, FCC 96-325 (released Aug. 8, 1996) ("Order") at ¶ 265.) For an ALEC to access these ILEC operational systems, it must interface its own systems with those of the ILEC. (Order at ¶ 265.)

AT&T has not listed GTE's operations support systems as one of the unbundled elements it seeks to purchase from GTE. Rather, AT&T

expects GTE to provide them for free. GTE contends that OSS are not an unbundled element and AT&T is required to pay for access to their functions. If it is determined that they are an unbundled element, AT&T must still pay for access to their functions.

Since GTE will create AT&T's electronic interfaces to these GTE systems exclusively for AT&T and other ALECs, the total cost for them under "total element long run incremental cost" ("TELRIC") pricing must be paid entirely by AT&T and the ALECs. To avoid this, AT&T focuses on other provisions of the Act in its discussion of operations support systems rather than the section specifically providing for unbundling.

Negotiations to provide AT&T nondiscriminatory access to GTE's operations support systems have generated a number of disputed issues that the parties have not yet resolved. These issues center on the extent to which GTE must develop entirely new operations support systems for AT&T, and on AT&T's refusal to pay for any such development. AT&T is demanding that it be provided immediate access to GTE's systems in many different ways and at different points, a number of which are neither available nor technically feasible today. GTE contends that AT&T's proposal for access to GTE's operational support systems goes beyond the Act's requirement that GTE permit AT&T to access the functions of these GTE's systems.

Assuming, arguendo, that GTE were willing or required to provide any or all of the new systems and capabilities sought by AT&T, the parties also have not reached agreement on who must pay for the cost of such enhancements or systems. As the FCC recently confirmed, ALECs such as AT&T must pay all costs associated with the provision of access to unbundled elements that they request. Related issues which likewise must be addressed in such circumstances are (1) the timing of the availability of any new systems or enhancements, (2) the establishment of mechanisms to ensure the security and integrity of GTE's systems and network, and (3) the confidentiality of GTE's and its customers' proprietary and other information.

In brief, GTE is unwilling to cede unrestricted control of its operational systems to AT&T, and the Act does not require it. GTE is willing to interconnect its equipment and facilities to those of AT&T and to other competing local carriers. GTE is willing to give AT&T access to certain unbundled network elements in accordance with the Act and the FCC. GTE is also willing to give AT&T access to GTE operations support systems functions so that AT&T orders for resold local service and unbundled network elements can be processed in a nondiscriminatory manner.

Generally, GTE will process AT&T orders for these items using the same systems GTE uses for its own local services. Thus, for example, the ordering and provisioning of resold services as well as

billing and maintenance for AT&T will be provisioned using GTE's data centers and the many operations support systems GTE uses for its own service. By the same token, it is not technically feasible at this time to provide at every level the variety of electronic interfaces or interconnection points to GTE's operational systems that AT&T demands. GTE is willing to explore the possibility in the future for certain specific types of multi-level "electronic bonding" to its systems functions that may become technically feasible. Indeed, AT&T appears to recognize that all the electronic bonding it seeks cannot be developed for some time. However, any necessary electronic bonding can be accomplished only if the costs associated with such interfaces are properly recovered and if the operation of the system and data within it, especially GTE's proprietary customer data, is not compromised.

**Q. ARE ANY ISSUES RELATED TO OSS ALSO IN DISPUTE?**

A. Yes. There are several OSS-related issues. Once AT&T provides local exchange service, it demands that GTE no longer make primary interexchange carrier ("PIC") changes submitted to it by other interexchange carriers ("IXCs") for AT&T local service customers. GTE should not be prohibited from making such changes if requested. AT&T also demands that GTE meet different service standards than GTE meets for its own customers. GTE believes this discrimination is improper. Also, AT&T demands that GTE be required to unbrand calls to GTE's service repair centers and that

GTE employees work under AT&T's brand. GTE should be allowed to keep its brand on its service repair centers just as AT&T will have its brand for its own service repair center. Further, GTE employees should continue to work under GTE's own brand. AT&T also requests that GTE bill AT&T's local customers for third party information service calls. GTE cannot perform this billing unless AT&T provides GTE the account information for AT&T customers necessary to bill those customers. Finally, AT&T requests electronic access to GTE customer account information. This is information that AT&T can obtain directly from its own customers just as GTE does today, and an electronic interface to GTE's system is not required.

**Q. WHAT ARE OPERATIONAL SUPPORT SYSTEMS?**

A. Overall, there are approximately 40 different operations support systems related to ordering, provisioning, usage, billing and repair for GTE's local exchange service. While it is not practical or necessary to discuss each one here, I will reference a number of the more important ones in this testimony to illustrate the technical complexity of both the various systems and their integration.

**Q. WILL GTE PERMIT AT&T TO USE GTE'S OSS ON THE SAME BASIS AS GTE USES THEM FOR ITS OWN OPERATIONS?**

A. Yes. There appears to be no significant controversy between the parties regarding whether GTE's operations support systems functions will be used for AT&T on parity with their use for GTE.

These systems are the same operations support systems GTE uses to provide its own local services. GTE's use of these operations support systems for AT&T's resold services and unbundled elements will be the same as for GTE's services. This parity of use will allow AT&T's ordering, provisioning and billing of its local services to be supported operationally on the same systems that GTE uses.

The discussion which follows will describe the operations support systems that GTE will use and the related functions that are available in the short term to AT&T for service ordering, service provisioning and billing. Trunk-side interconnection support systems will be discussed first, followed by a review of support systems for line-side interconnection. The various GTE systems discussed below are depicted in Exhibit No. RL-1 attached to this testimony.

**Q. HOW DOES GTE PLAN TO HANDLE TRUNK-SIDE INTERCONNECTION ORDERS FROM AT&T?**

A. AT&T will be able to order trunk-side interconnection services from GTE through a direct electronic interface over the GTE Network Data Mover ("NDM") in a nondiscriminatory manner just as it does today for access services. In fact, the systems that GTE will use to process trunk-side interconnection orders are the same systems that AT&T and other IXCs use today for the purchase of access services from GTE. Requests for switched and special access are processed

routinely today and the parties are very familiar with the process. The system has proved to be operationally sound over the years.

Orders for trunk-side interconnection will be initiated by an Access Service Request ("ASR") sent electronically by AT&T over the NDM. Again, this is the same data delivery vehicle that AT&T currently uses to order access services. ASRs for trunk-side interconnection will be entered electronically into GTE's Customer Access Management System ("CAMS") to validate the request, identify any errors, and resolve any errors back to AT&T. CAMS is a family of GTE systems comprised of EXACT/TUF, SOG/SOP, and CABS. See Exhibit RL-1.

**Q. CAN YOU EXPLAIN IN MORE DETAIL HOW GTE'S CAMS WILL INITIALLY ROUTE AND VERIFY THE ASR FOR TRUNK-SIDE INTERCONNECTION?**

A. Yes. GTE will route the ASR through its data center to one of two National Access Ordering Centers ("NAOC"). The ASR order will be entered electronically into the EXACT/TUF system for validation and correction of errors. Errors will be referred back to AT&T. AT&T then will correct any errors that GTE has identified and resubmit the request to GTE electronically through a supplemental ASR. GTE then will translate the ASR into a service order for provisioning and billing. In order to convert the ASR into a service order, GTE personnel must apply the necessary elements to provision the service and include the billable elements necessary for GTE to bill AT&T for

the services provided. This application also requires a determination of the access tandem to end office relationships with the service requested.

**Q. AFTER THE ASR IS TRANSLATED INTO A SERVICE ORDER, HOW DOES SERVICE PROVISIONING OCCUR?**

A. At the next system level, translated service orders will be distributed electronically through the SOG/SOP systems to several destinations. The SOG/SOP system will begin the actual provisioning of the service for AT&T. (Other GTE provisioning systems are CNAS and ACES.) The GTE Database Administrative Group ("DBA") and the Special Services Control Center ("SSCC") will be the two most important destinations at this level. The DBA location will identify codes for the appropriate GTE switch in order to provide the functions required by the ASR. The SSCC will provide the engineering for the facilities over which the services will be handled. Information from these two groups (and others) then will be transmitted electronically to GTE's field service personnel (Customer Zone Technicians or "CZTs") who will establish the trunks and facilities, thus connecting the GTE facilities to a connecting company, if one is required, and to AT&T. GTE's CZTs also will contact AT&T directly to perform testing, and upon acceptance by AT&T, will make the necessary entries into the GTE system to complete the order. The completed orders then will pass to GTE's Carrier Access Billing System ("CABS") which will

generate the bill to AT&T. The billing process under CABS requires coordination with several other systems.

**Q. PLEASE ELABORATE ON THE BILLING PROCESS.**

A. Billing cannot be accomplished without call records from GTE's central office switches. Records of usage will be generated at GTE's end office switches or the access tandems. Call usage records will be transmitted electronically from GTE's switches through GTE's Billing Intermediate Processor ("BIP"). This system will collect the call records, perform limited manipulations to the record and transfer them to a centralized data center where they will be processed through the Universal Measurement System ("UMS") to determine the validity and accuracy of the records. UMS also will sort the records and sends them to the CABS billing system, from which GTE will produce a bill and send it to AT&T.

**Q. WILL AT&T ALSO BE ABLE TO ORDER LINE-SIDE INTERCONNECTION DIRECTLY FROM GTE THROUGH AN ELECTRONIC INTERFACE?**

A. Yes. To initiate an order for line-side services (which include resale, unbundled loop, unbundled port and interim number portability), AT&T will submit a Local Service Request ("LSR") from its data center to GTE's Data Center using the same electronic NDM interface used for trunk-side interconnection. Thus, the same transport process and existing physical interconnections between the carriers

can be used. For new entrants that elect not to interface electronically, GTE will accommodate submission of LSR orders by facsimile, E-mail, Internet or a dial NDM arrangement.

An LSR is very similar to an ASR, except that it will be used exclusively for line-side interconnection requests. GTE will transfer LSRs to GTE's NOMC centralized service order processing center electronically. As noted above, for ALECs who decide not to use an electronic interface to reach GTE's data center, or who do not have data centers similar to AT&T's, GTE will accept requests for service through other forms or media directly to the NOMC.

**Q. WHAT KIND OF INFORMATION WILL A LSR INCLUDE?**

A. Depending on the situation, different information will be required on the LSR. Most LSRs will be used either to transfer an existing GTE customer to AT&T or to request service for a new customer who is not an existing GTE customer. LSRs for a conversion of a GTE local customer to AT&T must include information relating to all existing, new and disconnected services for that customer, including the customer's name, type of service desired, location of service and features or options the customer desires. For service to a new customer who is not an existing GTE customer, the LSR must contain the new telephone number and the due date assignment. Also, a user service address to GTE central office reference (SAG) and a list

of GTE products and services available for resale are currently provided to ALECs by magnetic tape or paper report.

**Q. WILL AT&T HAVE ALL THE INFORMATION ASSOCIATED WITH AN LSR IN ITS OWN DATABASES?**

A. No. While AT&T would have its own customer information and the SAG/GTE products on tape from GTE, AT&T would not have the due date or new telephone number for new customers since that information is contained in GTE's systems. Therefore, a process is required to provide this information to AT&T. GTE itself does not have uniform access to this information electronically. Until there is agreement on electronic interfaces, AT&T has agreed that an 800 number is the method that will be used. The 800 telephone number will connect AT&T directly to GTE's NAOC service representatives. When AT&T receives a request for service from a new local service customer, AT&T will call GTE's NAOC through the 800 number, and, while the new customer is on hold, GTE will provide the due date for service and the new telephone number for that customer. At the same time, AT&T will give GTE the new customer's name, service address and type of requested service (e.g., R1, B1, etc.). GTE will enter that information into its SORCES or SOLAR service ordering systems to be held in suspense until AT&T sends the confirming LSR. AT&T will then return to its customer holding on the line and provide the due date and new telephone number.

**Q. WHAT HAPPENS AFTER THE TELEPHONE CALL IS OVER?**

A. After concluding the telephone call with the new customer, AT&T will complete a confirming LSR for the new service and send it electronically to GTE's data center for processing. Upon receipt, GTE will match the LSR with the service order suspended in GTE's system, and if there is a match, GTE will process the LSR. After the LSR is processed, GTE will transmit confirmation electronically to AT&T through the NDM that the LSR has been processed, providing a record of the telephone number and due date. Of course, GTE cannot hold the LSR in suspension forever. Thus, AT&T will be required to submit the confirming LSR by 12:00 p.m. each day local time, as defined by the location of the service address. If AT&T fails to submit the LSR in a timely manner, the suspended LSR will be considered in jeopardy, at which time GTE will assign a new due date for such customer and notify AT&T of the change. Once the electronic interface is created for due dates and telephone numbers, the suspension process would be eliminated.

**Q. HOW WILL NUMBERS AND DUE DATES BE ASSIGNED FOR SERVICES OTHER THAN SINGLE-LINE SERVICE?**

A. Number assignments and due date schedules for services other than single line service will be assigned using the standard Firm Order Confirmation ("FOC") report sent electronically to AT&T over the NDM, thereby providing a record of the newly established due date. An exception would be a multi-line hunt group, for which the pilot

number first will be provided by the 800 number. The other numbers then will be provided through the normal electronic confirmation process.

**Q. HAVE GTE AND AT&T DISCUSSED THE PROCESSING OF SO-CALLED VANITY NUMBERS?**

A. Yes. GTE has committed that it will work with AT&T on a real time interface to process specifically-requested, or vanity, numbers while AT&T's customer is still on the line. If a number solution can be established expeditiously, it will be done while the customer is still on the line. If extensive time will be required to find a solution, GTE service representatives will work with AT&T representatives off line as GTE would for its own customers. For all of this, of course, the basic tariff guidelines for providing telephone numbers will be followed.

**Q. WHAT IS THE NEXT STEP AFTER THE ORDER FOR LINE-SIDE INTERCONNECTION SERVICE IS ESTABLISHED?**

A. Once the order is established, it is moved for provisioning to the next system level. Here, GTE will validate and process the LSR to establish an account for AT&T and, if GTE continues to provide some residual services to the customer, GTE will maintain a GTE account. In GTE's system, GTE's account is called the Residual Account and AT&T's account is referred to as the ALEC Account. If any engineering for the service is necessary, the account would be

distributed to the SSCC. Otherwise, it will be distributed for facility assignment.

With the account established and any engineering and facility assignment complete, GTE then will transmit electronically a record to GTE's CZT field personnel if physical interconnection or similar activity is required. The CZTs will provision the service and then electronically confirm such provision in the SOLAR/SORCES system when completed. The accounts then will be transmitted to GTE's Customer Billing Services System ("CBSS"). Call records for actual service provided to AT&T's customers on GTE facilities will be transmitted from GTE's switches through several usage rating systems (BIP, UMS, Call Recording), screened and eventually delivered to CBSS for the generation of bills.

**Q. IS CBSS DIFFERENT FROM CABS?**

A. Yes. CBSS is the same system that generates GTE's own end user bill for GTE local and residual services (those that GTE continues to provide to AT&T or other ALEC local service customers that are not subject to resale), so that AT&T will have system use parity with GTE. GTE is working to enhance CABS to handle both trunk-side and line-side billing. For now, CBSS will create a bill to AT&T for resold services and unbundled elements along with a summary bill master. Daily file records on AT&T's accounts also will be generated and transmitted electronically to AT&T.

**Q. WILL GTE'S NDM ALSO HANDLE AT&T'S DIRECTORY ASSISTANCE AND DIRECTORY LISTING INFORMATION?**

A. Yes. In addition to the LSR delivery process, AT&T will distribute directory assistance and directory listing information (together sometimes referred to hereafter as "DA/DL information") to GTE's Data Center over the NDM. GTE will sort the data containing this information and process it to GTE's directory publication company and its directory assistance bureaus.

**Q. WILL GTE ALLOW AT&T TO ACCESS ITS SERVICE MAINTENANCE SYSTEMS?**

A. Yes. There is no dispute that AT&T requests for repair will have access to GTE's service maintenance support systems functions. Again, the maintenance operations support systems which GTE will use for AT&T are essentially the same as those GTE uses to provide its own local repair service. The maintenance operations support systems and procedures discussed below are depicted in Exhibit RL-2 in the attachments to this testimony.

**Q. HOW WILL GTE PROCESS AT&T'S TROUBLE REPORTS?**

A. If AT&T requires maintenance for its local service customers, AT&T will initiate a request for repair--typically called a trouble report--by calling GTE's Customer Care Repair Center. (If an AT&T end-user contacts GTE's repair center directly, GTE will provide a telephone

number and refer the customer to AT&T for origination of the repair report. AT&T would do the same for GTE customers.)

During the call to the Customer Care Repair Center, GTE service representatives will verify that the end-user is an AT&T customer and will then obtain the necessary information from AT&T to process the trouble report. While the AT&T representatives are still on the line, GTE personnel will perform an initial analysis of the problem and remote line testing for resale services. If engineered services are involved, the call will be made to the GTE SSCC for handling. If no engineering is required and the line testing reveals that the trouble can be repaired remotely, GTE personnel will correct the problem and close the trouble report while AT&T representatives are still on the line. If on-line resolution is not possible, GTE personnel will provide AT&T representatives a commitment time for repair and a trouble ticket number, and the GTE personnel then will enter the trouble ticket into the GTE service dispatch queue. AT&T's repair service commitment times will be within the same intervals as GTE provides to its own end users.

Repair calls to the SSCC for engineered services will be processed in essentially the same manner as those by the GTE Customer Care Center. GTE personnel will analyze the problem, provide the AT&T representative with a commitment time while they are still on the line, and then place the trouble ticket in the dispatch queue.

GTE then will process all AT&T trouble reports in the dispatch queue along with GTE trouble reports in the order they were filed (first in, first out), with priority given to out-of-service conditions. If, at any time, GTE would determine that a commitment time given to AT&T becomes in jeopardy, GTE service representatives will contact AT&T by telephone to advise of the jeopardy condition and provide a new commitment time.

Trouble reports in the dispatch queue will be transmitted electronically to GTE CZT service technicians who will repair the service problems and clear the trouble reports. For cleared AT&T trouble reports, GTE service technicians will make a telephone call to AT&T directly to clear the trouble ticket. GTE service technicians will make the confirmation call to the telephone number provided by AT&T. If AT&T is unable to process the call or places the GTE technician on hold, the call will be terminated. To avoid disconnect, AT&T may develop an answering system, such as voice mail, to handle the confirmation calls expeditiously.

**Q. HAS AT&T ALSO DEMANDED ON-LINE ACCESS TO GTE'S MAINTENANCE SUPPORT SYSTEMS TO "STATUS" AND CLOSE TROUBLE TICKETS?**

A. Yes. This is an unreasonable request, as an electronic interface would need to be developed, which would take years to create at significant cost.

**Q. ARE THERE ANY DIFFERENCES IN GTE'S PROCESSING OF ITS OWN AND AT&T'S REPAIR REQUESTS THAT WOULD HARM AT&T IN THE MARKETPLACE?**

A. No. GTE will resolve repair requests by or for AT&T local service customers using GTE's existing repair system in parity with repair requests by GTE customers. GTE will respond to service requests for AT&T using the same time parameters and procedures that GTE uses. The only difference is that, until electronic interfaces between GTE and AT&T can be developed, GTE customers would call the GTE Customer Care Center directly, while AT&T customers would be required to call AT&T. AT&T then would call GTE's Customer Care Center or SSCC while the customers were on hold. This difference, however, is not material and would be transparent to the customer. AT&T repair customers would not be aware what AT&T representatives were doing while they were on hold. GTE also places its own repair customers on hold when processing repair orders. On average, the time to process the respective GTE and AT&T repair calls would not be qualitatively different from the perception of its customers.

**Q. IS THE ACCESS GTE WILL PROVIDE AT&T TO ITS OSS CONSISTENT WITH THE ACT?**

A. Section 251 of the Act imposes a number of obligations upon ILECs -- including duties of interconnection, resale, number portability, dialing parity, access to rights-of-way, reciprocal compensation, negotiation,

unbundled access, notice of changes, and collocation. However, the duty of "operation system creation" is not listed. Section 251(c)(2) requires GTE to interconnect with the equipment and facilities of AT&T, and Section 251(c)(3) of the Act requires GTE to provide certain unbundled network elements to AT&T. Although the FCC has required ILECs to complete such "modifications" as are necessary to accommodate ALEC access, (Order at ¶ 524), GTE is not required to create AT&T's equipment and facilities. Nor must GTE develop new systems or enhancements to its own systems (other than access capabilities) merely because AT&T may desire it. This is not to say that a telecommunications carrier could not contract with GTE to develop various operational systems. Such an agreement, however, would be beyond the scope of any requirements of the Act.

**Q. WHAT, SPECIFICALLY, ARE THE ILECS' OBLIGATIONS UNDER THE ACT?**

A. The Act imposes a duty upon ILECs to interconnect their networks to the equipment and facilities of requesting new local market entrants. Section 251(c)(2) provides:

> (2) INTERCONNECTION.-The duty to provide, for the facilities and equipment of any requesting telecommunications carrier, interconnection with the local exchange carrier's network -
>
> (A) for the transmission and routing of telephone exchange service and exchange access;
>
> (B) at any technically feasible point within the carrier's

network;

(C) that is at least equal in quality to that provided by the local exchange carrier to itself or to any subsidiary, affiliate, or any other party to which the carrier provides interconnection; and

(D) on rates, terms, and conditions that are just, reasonable, and nondiscriminatory, in accordance with the terms and conditions of the agreement and the requirements of this section and section 252.

In addition, section 251(c)(3) of the Act requires ILECs to provide nondiscriminatory access to network elements. It provides, in relevant part:

UNBUNDLED ACCESS.- The duty to provide, to any requesting telecommunications carrier for the provision of a telecommunications service, nondiscriminatory access to network elements on an unbundled basis at any technically feasible point on rates, terms, and conditions that are just, reasonable, and nondiscriminatory in accordance with the terms and conditions of the agreement and the requirements of this section and section 252.

"Network element" is defined in the Act as a "facility or equipment used in the provision of a telecommunications service. This term also includes features, functions, and capabilities that are provided by means of such facility or equipment, including subscriber numbers, databases, signaling systems, and information sufficient for billing and collection or used in the transmission, routing, or other provision of a telecommunications service." (Act at sec. 153(29).) FCC regulations identify OSS and information as one of seven network elements. (Order at ¶ 504.)

Finally, section 251(b)(1) of the Act imposes a duty on ILECs not to impose unreasonable and discriminatory conditions or limitations on the resale of telecommunications services.

**Q. DID THE FCC'S INTERCONNECTION ORDER FURTHER EXPLAIN THESE STATUTORY REQUIREMENTS?**

A. Yes. In its decision, the FCC stated that "operational support systems and the information they contain fall squarely within the definitions of 'network element' and must be unbundled upon request under 251(c)(3)." (Order at ¶ 265.) It also concluded that "competing carriers must be able to perform the functions of pre-ordering, ordering provisioning, maintenance and repair, and billing for network elements and resale services in substantially the same time and manner that an incumbent can for itself." (Order at ¶ 266 (emphasis added).) Thus, the FCC concluded that ILECs must provide

nondiscriminatory access to their operations support system functions, including the ILEC electronic interfaces it has created for its own access to these systems. According to the FCC, this access "includes access to the functionality of any internal gateway systems the incumbent employs in performing the above functions for its own customers." (Order at ¶ 269.)

**Q. IS GTE REQUIRED TO PROVIDE ACCESS TO ITS OSS ANYWHERE AT&T DEMANDS IT?**

A. No. Under the Order, AT&T may develop and create its own operational systems, or it may acquire access to GTE's operational support systems functions. Such access, however, need not be provided at each and every point that AT&T demands. It need only be nondiscriminatory access (i.e., only where GTE provides itself access) and only at technically feasible points. Equally important, such access is not free. It is to be provided on rates, terms and conditions that are just, reasonable and nondiscriminatory and that ensure full cost recovery for GTE.

In summary, GTE's obligation is to provide AT&T nondiscriminatory access to its operations support systems functions for pre-ordering, ordering, provisioning, maintenance and repair, and billing. To the extent AT&T requests to use GTE's operational systems functions instead of AT&T's own, GTE will provide AT&T such access as required by the Act. If technically feasible, GTE does not oppose the

creation of additional real time electronic interfaces to its system at other points on rates, terms and conditions that are just, reasonable and nondiscriminatory. However, GTE does oppose creating such systems if its expenses are not properly compensated.

**Q. PLEASE BRIEFLY LIST THE ISSUES PRESENTED IN THIS ARBITRATION AND THE PARTIES' RESPECTIVE POSITIONS ON THEM.**

A. As I stated above, there is generally no dispute that AT&T will have access to GTE's operations support systems functions for its competing local telephone service. The disputed issues on this subject center almost entirely upon the electronic interfaces that AT&T wants to use to reach GTE's systems. Other issues related to operations support systems must also be addressed. The operation support systems and related questions submitted for arbitration are:

Operations Support Systems

(1) *Will AT&T have nondiscriminatory access to GTE's operations support systems?*

**AT&T's Position:** GTE must provide AT&T "on-line" electronic access to all of GTE's operational support systems themselves.

**GTE's Position:** GTE will provide AT&T nondiscriminatory access under the Act to GTE's operations support systems functions available to GTE, but it need not provide "on-line" access to such GTE systems themselves.

(2) *When should the long-term solution to the electronic interfaces required by the Act between AT&T and GTE operations support systems be implemented?*

**AT&T's Position:** GTE must implement all electronic interfaces AT&T demands by 1997.

**GTE's Position:** The implementation of electronic interfaces between the parties must be reasonably related to the actual work required to create the necessary electronic bonding between systems.

(3) *Who will pay for the expenses GTE incurs to create the necessary electronic interfaces for AT&T?*

**AT&T's Position:** GTE and all the ALECs should pay for the costs.

**GTE's Position:** AT&T should pay the costs.

Other Issues Related to Operations Support Systems

(4) *How will PIC changes be made for AT&T local customers?*

**AT&T's Position**: Other IXCs must make PIC changes for AT&T local exchange service customers only through AT&T.

**GTE's Position:** PIC changes for AT&T local exchange service customers may be made through GTE directly.

(5) *What quality standards must GTE maintain for AT&T's local exchange service customers?*

**AT&T's position:** GTE must meet AT&T's unique quality standards for all services to AT&T local exchange service customers.

**GTE's Position:** GTE will provide services to AT&T customers on a nondiscriminatory basis.

(6) *How are GTE's repair call routing and service technicians visits to be branded?*

**AT&T's Position:** GTE must remove its brand from calls to GTE's Customer Care Centers and have its service technicians carry AT&T's brand.

**GTE's Position**: GTE's brand should remain on calls to Customer Care Centers and GTE is not required to have its employees work under AT&T's brand.

(7) *Who will bill for third-party information service charges incurred by AT&T customers?*

**AT&T's Position:** GTE should bill AT&T customers for third-party information service calls until AT&T has a billing and collection agreement with such third-party service providers.

**GTE's Position:** GTE may provide such third-party information service provider billing for AT&T if AT&T will provide its customer account information necessary to bill AT&T customers to GTE.

(8) *Should AT&T be permitted access to GTE's customer account information without authorization?*

**AT&T's Position:** GTE must transfer customer account information without customer consent.

**GTE Position:** GTE customer account information is "Customer Proprietary Network Information" under the Act and cannot be disclosed without customer authorization.

Below, I explain in more detail GTE's positions on each of the disputed issues.

**Q. DOES AT&T WANT ACCESS ON A BASIS THAT EXCEEDS PARITY?**

A. Yes. The access to GTE's ordering, service provisioning and billing systems functions described above allows use of GTE's local service support systems functions for AT&T on parity with GTE. But AT&T wants more than this. AT&T demands unlimited real time access to GTE's operating systems themselves through electronic bonding at various levels. It demands, for example, that GTE develop new systems that would allow AT&T to interface GTE's various OSS that track service availability, dispatch GTE service technicians, manage GTE facility capacity, track service completion, track service order status, track trouble reports, monitor GTE's network, and provide remote testing of the service for AT&T's customers. The parties have agreed, and AT&T has acknowledged, that the creation of such new systems is not technically feasible in the near future.

GTE will provide AT&T access to GTE's operations support systems functions required by the Act, but not to the systems themselves. Access directly to GTE's systems is not required by the Act. To this end, the FCC has stated: "In all cases...we conclude that in order to comply fully with section 251(c)(3) [unbundling] an incumbent LEC must provide, upon request, nondiscriminatory access to operations support systems functions." (Order at ¶ 525 (emphasis added).)

**Q. WHAT ARE THE DRAWBACKS OF ALLOWING AT&T DIRECT ACCESS TO GTE'S OSS?**

A. GTE's operational support systems were designed for a single ILEC environment. Thus, they have no partitioning ability to protect proprietary data. Without partitioning, every ALEC that accesses the GTE systems could manipulate the systems making them impossible to manage. Further, such manipulation would compromise the integrity of the systems. The result would be electronic anarchy. Without the ability to partition or "firewall" the data elements within GTE's systems, GTE, AT&T and any other ALEC would be able to access each other's data, thereby compromising the privacy rights of all end users. More importantly, the Act and the FCC's Order require access only as to system functions and not as to the systems themselves.

The system function access GTE provides AT&T to process and provision its service with GTE's operations support systems does provide system usage parity with GTE. This process described above gives AT&T the ability to interface with GTE systems and for GTE to provision AT&T service orders in parity with GTE.

**Q. IS GTE REQUIRED TO PROVIDE AT&T ACCESS TO ITS OSS FUNCTIONS UNDER TERMS AND CONDITIONS THAT ARE DIFFERENT THAN THOSE UNDER WHICH GTE ITSELF ACCESSES ITS OSS?**

A. No. GTE does not oppose providing AT&T access to GTE operations support systems functions in substantially the same time and manner GTE does for itself, and on terms that are just, reasonable, and nondiscriminatory according to the Act. GTE does not agree, however, nor is it required by the Act, to provide its operations support systems functions to AT&T at different terms and manner than it does for itself.

For example, AT&T requests that GTE provide customer usage data electronically for AT&T's local exchange customers on a daily basis. AT&T seeks information such as call record detail, number of attempts customers have made to place a call, statistics on call completions, call termination points, and similar customer call detail information. GTE does not generally collect all this type of information for its own local service. Thus, AT&T is not seeking the same information GTE uses in order to be at parity with GTE. Rather AT&T wants more information than GTE collects for itself. This is not required under the Act. GTE will provide the type of customer call detail information that AT&T seeks to the extent any such information is collected and used by GTE to bill its own customers. GTE also will explore possible enhancements to its existing operations support systems that would generate the information AT&T seeks if AT&T commits to pay the associated costs. However, none of this can be accomplished overnight. In the interim, AT&T must accept the call detail information which GTE collects for its own customers.

Again, AT&T seeks an electronic access to telephone numbers and due dates for preparation of LSRs. GTE itself does not maintain a pool of numbers from one data base. The same is true for due date management. GTE itself does not have electronic access uniformly to this information. Thus, the electronic interfaces AT&T seeks for this would be superior to GTE's own access to this information.

**Q. DOES GTE AGREE THAT SOME ELECTRONIC INTERFACES TO ITS OSS FUNCTIONS MUST BE CREATED TO COMPLY WITH THE ACT?**

A. GTE does not dispute this point. It is willing to explore electronic bonding for such administrative functions as due date scheduling, number administration, identification of line options, street address verification, service dispatch, rejection orders, and installation appointment scheduling. Certainly, the determination of who will pay for the costs to develop the new systems that AT&T wants, as well as the development of a way to partition the systems to prevent unrestricted access to propriety information or manipulation of data, first must be resolved satisfactorily. The electronic interfaces required by the Act will be developed, but the cost will be substantial.

**Q. CAN YOU GIVE SOME IDEA OF THE COST AND MAGNITUDE OF EFFORT INVOLVED IN DEVELOPING THE REQUISITE ELECTRONIC INTERFACES?**

A. The level of effort is so substantial that it may even require

replacement of GTE's operational systems or significant modification to them. Over approximately the last four years GTE has engaged in an unprecedented overhaul of its operations support systems, spending almost $400 million to bring its systems to the level they are today. The work to develop AT&T's electronic interfaces is of the same magnitude. To scrap GTE's systems would be extremely detrimental to GTE and an enormous waste of money, time and other valuable resources. Until the interfaces can be developed, acess to GTE systems functions described above will provide AT&T and other ALECs the same operating support mechanism that GTE uses to order and provision local services and to bill customers.

**Q. HAS GTE BEEN ABLE TO DETERMINE ALL THE STEPS INVOLVED IN DEVELOPING THE ELECTRONIC INTERFACES?**

A. No. As I said, it is clear that a significant amount of work is required to develop the electronic interfaces that AT&T requests. GTE's operations support systems are complex and integrated; the Company has only begun the initial analysis to determine exactly which systems will be affected and what work must be accomplished to meet the electronic bonding requirements. At the present time, it is unclear what detailed requirements must be met to create the various interfaces, but it is certain that, at a minimum, numerous systems will be affected.

For example, to partition access to GTE accounts which are not resold or provided to individual ALECs will require the establishment of ALEC identification codes and the creation of front end processors to the various GTE systems in order to exchange information, convert protocol, edit input/output, reject transactions, etc. Further, the process and procedures involving GTE's systems are not uniform throughout the country. In some locations, GTE uses printed documents, desk top references, and general knowledge of personnel to perform such functions as due date assignment or telephone number assignment. The development of front-end processors in such cases actually would provide AT&T superior access to functions than GTE itself has today. Finally, security codes must be established to determine availability of read and/or write access to GTE's systems, as well as the level of access allowed. The creation and administration of vast numbers of security codes will be required.

**Q. HAS GTE GENERALLY DETERMINED WHAT PROPORTION OF ITS SYSTEMS WILL BE AFFECTED?**

A. GTE has analyzed at a high level the operations support systems which will be affected if they are to provide all of the required electronic bonding that AT&T requests. It appears that almost every system will be affected in some way. For example, GTE's trouble reporting system ("TAS") likely will be accessed by AT&T through GTE's ACG/EB system. Updates and additional changes will be required to the systems. Several restrictions must be incorporated

into the systems to accommodate the interface with AT&T. The systems must be modified to limit AT&T trouble ticket creation and trouble history information only to AT&T end users. The EB system, for example, must be modified to capture usage for billing purposes that is time and access sensitive.

TAS is only one system. GTE's 4TEL, HEIKEMIAN, ESARTS, ACES/CNAS, Subscription Services Systems, SOLAR/SORCES, MARK, Due Date Manager, SAG, TDO/RCO/ONP, UMS, CBSS, and CABS are just a few of the other systems that have been identified for significant modifications. At least another 20 or more systems likely will be impacted and will require modification. The magnitude of what must be accomplished to meet the Act's electronic interface requirements is comparable to GTE's ongoing, $400 million overhaul of its internal operations support systems.

**Q. DOES IT MAKE SENSE TO SET AN IMPLEMENTATION SCHEDULE FOR THE ELECTRONIC BONDING AT&T SEEKS WITHOUT FIRST KNOWING WHAT WORK IS INVOLVED IN SUCH IMPLEMENTATION?**

A. No. Common sense dictates that it is impossible to set a realistic completion date for a project before it is even known what that project will entail. AT&T has acknowledged in negotiations with GTE that the electronic interfaces that GTE is required to create would take several years. In fact, it had proposed a minimum of almost two years

for GTE to develop them. AT&T also has agreed to interim solutions to the interfaces as discussed above, such as using 800 numbers. It is disingenuous for AT&T now to suggest that GTE develop the electronic interfaces it wants by 1997.

GTE should not be required to create electronic interfaces not required by the Act that provide AT&T superior access to GTE's operations support systems. GTE should also not be required to develop the electronic bonding interfaces required by the Act in a time frame that fails to consider the necessary work and the time period within which such work reasonably can be accomplished. GTE should be allowed a reasonable time to determine exactly what must be done to develop the electronic interfaces required by the Act. Once this determination is made, GTE then should be permitted to present for approval a report of the necessary work, the cost and GTE's implementation plan.

**Q. WHO SHOULD PAY FOR THE DEVELOPMENT OF THE ELECTRONIC INTERFACES AT&T WANTS?**

A. The development of such interfaces raises the question of who will pay for them. GTE requires that AT&T pay for them. AT&T's approach is to suggest that the operations support systems network element be unbundled and provided through interfaces by GTE for free as part of the general duty of interconnection and resale. GTE does not believe that OSS are an unbundled element. However, the

FCC has stated in its Order that OSS and the associated interfaces are separate network elements that can be unbundled and purchased. Unbundled elements are not free. Thus, the Act does not require GTE to absorb the costs of electronic interface development. Such capital investment would be made at the request of AT&T. Such new systems would inure completely to the benefit of AT&T. There would be no benefit to GTE at all.

**Q. HOW SHOULD THE INTERFACES COSTS BE RECOVERED?**

A. Section 251(c)(3) of the Act provides that unbundled elements are to be provided at rates, terms and conditions that are just, reasonable, and nondiscriminatory. The FCC's Order states that the network elements are to be priced so as to recover the forward-looking economic costs of providing the applicable element. (Order at ¶ 676.) The electronic operations support systems interfaces that GTE is required to develop are requested only by AT&T. Unlike other unbundled elements that also have been used by GTE for its local service, GTE itself will have no use for the electronic interfaces. Under TELRIC pricing, all of the development costs for these interfaces are to be paid by AT&T. These development costs are nonrecurring costs and should be structured within the pricing of the total operations system network element pricing (that would also include usage) so as to be recovered by GTE within three years.

**Q. WILL CLARIFYING PAYMENT TERMS AND RESPONSIBLITY AS YOU HAVE PROPOSED ENSURE EFFICIENT DEVELOPMENT OF INTERFACES?**

A. Yes. AT&T should be prompted to evaluate exactly what interfaces it can afford to purchase. While AT&T may find it desirable to have all the electronic interfaces it requests, AT&T may wish to revaluate its interface requirements once the cost for such development has been calculated. A cost/benefit analysis must be performed before the parties decide what interface systems should be developed and what the time frame for this development should be.

This does not mean that AT&T could not have electronic bonding systems required by the Act, and even if they would not be required under the Act. What it does mean, however, is that AT&T must decide before the cost is incurred if it is willing to pay for them.

**Q. SHOULD GTE BE ALLOWED TO MAKE PIC CHANGES UPON REQUEST BY OTHER INTEREXCHANGE CARRIERS OR THEIR CUSTOMERS?**

A. Yes. The parties do not dispute that when an AT&T local customer calls AT&T to make a primary interexchange carrier ("PIC") change, the AT&T customer representative will notify GTE which, in turn, will make the change. There is disagreement, however, over how the process will work if the AT&T local customer's new interexchange carrier calls GTE directly to make the PIC change. AT&T opposes

any other interexchange carrier contacting GTE directly to make a PIC change for an AT&T local customer. A process allowing GTE to make such PIC changes instead of referring them to AT&T unquestionably would be more efficient and less cumbersome. Yet, AT&T is not concerned about efficiency for the apparent reason that if AT&T local customers or their new IXCs are required to go through AT&T to contact GTE for PIC changes, AT&T will have the opportunity to persuade its local customer to stay with AT&T instead of changing to another carrier.

It is possible that the Ordering and Billing Forum ("OBF") committee may develop an industry standard on how PIC changes in these circumstances will be made, and GTE likely would comply with any such standard. Nevertheless, until such standard is developed, GTE should not be prohibited from making PIC changes upon request by other interexchange carriers or their customers.

**Q. SHOULD GTE BE FORCED TO ADOPT DIFFERENT SERVICE STANDARDS FOR AT&T THAN IT HAS FOR ITSELF?**

A. No. GTE has not agreed to AT&T's demands to adopt unique AT&T standards just for AT&T local service customers. GTE cannot operate its network at different quality standards for different customers. All customers on GTE's network are provided service at the same level without distinction.

**Q. DOES THE ACT MANDATE ANY PARTICULAR SERVICE STANDARDS?**

A. No, the Act does not mandate any particular service standards for ILECs with respect to resold services or interconnection generally. Section 251(c)(2) requires that an ILEC provide interconnection to an ALEC at the same quality standards applicable to the ILEC. Resold services must not impose unreasonable or discriminatory conditions or limitations. (Act at § 251(c)(4)(B).) Thus, AT&T's demands are not only not required by the Act, but also are prohibited. GTE is not required to meet different standards for AT&T and every other competing local exchange carrier interconnecting with GTE. GTE will provide the services it is required to offer AT&T in a nondiscriminatory manner and at the same quality standards applicable to its own customers.

**Q. SHOULD AT&T BE PERMITTED TO PENALIZE GTE FOR NOT MAINTAINING AT&T-IMPOSED SERVICE LEVELS?**

A. Certainly not. AT&T has requested that a "self-enforcing mechanism" be established to deter GTE from degrading AT&T's service. AT&T misleadingly labels this mechanism as "liquidated damages." In reality, the mechanism is simply a penalty assessed and enforced unilaterally by AT&T. This is not appropriate because GTE will be using the very same operations support systems it uses to provide its own local exchange service when it provides AT&T use of its operation support systems under the Act. These services will be

offered using exactly the same facilities provided for GTE customers. There will be no degradation of AT&T's use of the facilities. As discussed above, the GTE operations support systems made available to AT&T will give AT&T use of such systems in parity with GTE.

More importantly, liquidated damages should not be used as a penalty. If GTE were to degrade AT&T's local service, a number of legal remedies are available to AT&T which will serve as a sufficient deterrent to GTE. GTE does not have any history of illegal, anti-competitive conduct. In fact, given that GTE has voluntarily agreed in negotiations to provide service and operations support systems in parity with GTE, AT&T's suggestion that it should be able to impose penalties on GTE in addition to AT&T's current legal remedies should be rejected. Failure to adhere to the standards required under the Act or Commission quality of service standards should be enforceable under existing mechanisms of the Act or under the same procedures by which violations of Commission rules or standards are addressed.

**Q. SHOULD GTE BE PROHIBITED FROM "BRANDING" ITS OWN CUSTOMER CARE CENTERS?**

A. No. AT&T has asked GTE to remove the GTE brand from communications with customers who call the GTE Customer Care Centers, and that GTE route AT&T customer repair calls made to GTE directly to the AT&T repair centers.

GTE will provide repair services for the interconnection services it provides AT&T. Such services will be the same in quality and response time as those GTE provides for its own customers. GTE will continue to provide its own repair service from its Customer Care Centers. Such services are GTE services and are provided by GTE employees. It is unreasonable not to allow GTE to identify the Customer Care Centers as GTE offices.

GTE should be able to maintain repair centers that can be identified as GTE's own. AT&T will be able to have its own repair center along with its own discrete telephone number which can be identified as belonging to AT&T. While it is possible that AT&T customers could call GTE repair centers by mistake, this possibility is no reason for GTE to stop using its brand for its Customer Care Centers (any more than it is reasonable for AT&T to cease using its brand because of the possibility that a GTE customer might call an AT&T repair center by mistake).

GTE should be allowed to continue to use its brand for its own repair centers. Should an AT&T customer misdirect a call to GTE's Customer Care Center, GTE will provide that customer with the telephone number of AT&T's repair centers.

**Q. SHOULD GTE'S SERVICE TECNICIANS BE FORCED TO REPRESENT THEMSELVES AS AT&T AGENTS?**

A. No. AT&T proposes that GTE technicians represent themselves as AT&T agents on service calls to AT&T local service customers. AT&T would have the GTE technicians carry AT&T branded business cards and AT&T branded forms. These are unreasonable requests. GTE service personnel providing repair service to AT&T customers are GTE employees. If GTE employees were required to carry AT&T branded material, GTE undoubtedly would be asked to do the same for other similarly situated ALECs. GTE service personnel ultimately would spend inordinate amounts of time trying to determine for whom they were working and coordinating the branding of their various competing carriers. Not only would this create an administrative nightmare, it would harm productivity and service delivery. GTE is, however, willing to use an unbranded no access door-hanger when providing repair services to AT&T and other ALEC customers.

**Q. SHOULD GTE BE FORCED TO CONTINUE BILLING ITS CUSTOMERS FOR THIRD-PARTY INFORMATION SERVICE CHARGES?**

A. No. AT&T wants GTE to continue to bill its customers for third-party information service charges, such as "900" calls, as AT&T has no billing and collection agreements with the various third-party information service providers ("ISPs"). It is true that GTE currently has billing and collection agreements with ISPs. However, for GTE local service customers today that move to AT&T for their local service, GTE no longer will have the customer account information

necessary to bill those customers. Thus, regardless of whether GTE has a contract to bill for third-party information services, it would apply only to GTE customers.

Furthermore, the fact that AT&T has not negotiated a billing and collection agreement with third-party information service providers is irrelevant to this issue. There may be a number of contracts AT&T has not negotiated with respect to its proposed local service offerings. But AT&T has known for some time that it would become a local service provider, and its failure to secure contracts with third-party information services is not GTE's fault. Further, nothing prevents AT&T from now entering into billing and collections agreements with third-party information service providers. Thus, AT&T should be required to bill for third-party information service calls just like any other local exchange carrier.

Nevertheless, GTE has agreed to assist in the billing for such services to end users until AT&T negotiates and implements billing and collection agreements with such third-party information services. However, in order to bill customers directly for third-party information service providers, GTE will require all necessary account information for AT&T's customers in order to bill those customers according to GTE's contract with the third-party information service provider.

**Q. SHOULD AT&T BE ABLE TO ACCESS GTE'S CUSTOMER ACCOUNT INFORMATION WITHOUT CUSTOMER PERMISSION?**

A. No. GTE obtains certain data from its customers when service is initiated with GTE. This data includes, for example, the customer name, address and telephone numbers and the services the customer ordered. This is the same information that AT&T will obtain directly from any new customer it might serve. AT&T proposes, however, that it not be required to obtain this information directly from its customer as GTE must do. It recommends that for any GTE customer that agrees to obtain some type of service from AT&T, GTE must automatically transfer that customer's entire local service account to AT&T.

AT&T does not specify the type of "AT&T service" request that would trigger the automatic transfer of GTE's entire local service account information. AT&T is also a toll service provider. Presumably, a request for toll service would not trigger the automatic transfer of GTE's local service account to AT&T. Would the purchase of a B-1 line or one special circuit from AT&T trigger the total GTE business account transfer? Would it trigger the transfer of residential service for that customer? Clearly it should not trigger such transfers without customer approval. Customer consent should be clearly and unmistakenly obtained. "Slamming" has been a significant problem in the long distance business, and, although AT&T would not be expected to "slam" GTE local customers, less scrupulous carriers

might if the automatic transfer AT&T requests could be made without customer authorization. As a result, GTE customers must complete a letter of authorization for all services they elect to transfer to an ALEC.

More importantly, AT&T does not need to have access to GTE for information in connection with the ordering, provisioning, billing or maintenance of its local service. It can obtain this information directly from its customers or from GTE with customer authorization. AT&T claims electronic access to this information is required because of the time it takes to complete a service order. However, such "on-line" access also allows AT&T to track GTE customers and, based on the level of service with GTE, target them for marketing of its own local or toll services. Since GTE will not have any access to AT&T's similar customer account information, this would give AT&T a competitive marketing advantage.

Unrestricted or unauthorized access to GTE's customer account information also raises the issue of customer proprietary information protection. Clearly, if AT&T were able to access directly all GTE customer accounts, the proprietary nature of the information contained in the accounts would be jeopardized. Section 222 of the Act protects such "Customer Proprietary Network Information." GTE may not disclose this information without the customer's approval. While section 222(d) of the Act does allow all carriers to use such

information for purposes related to serving their own customers, it does not permit release of the information to another carrier to serve that customer. AT&T should not be allowed to have unauthorized electronic access to GTE's customer accounts.

**Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?**

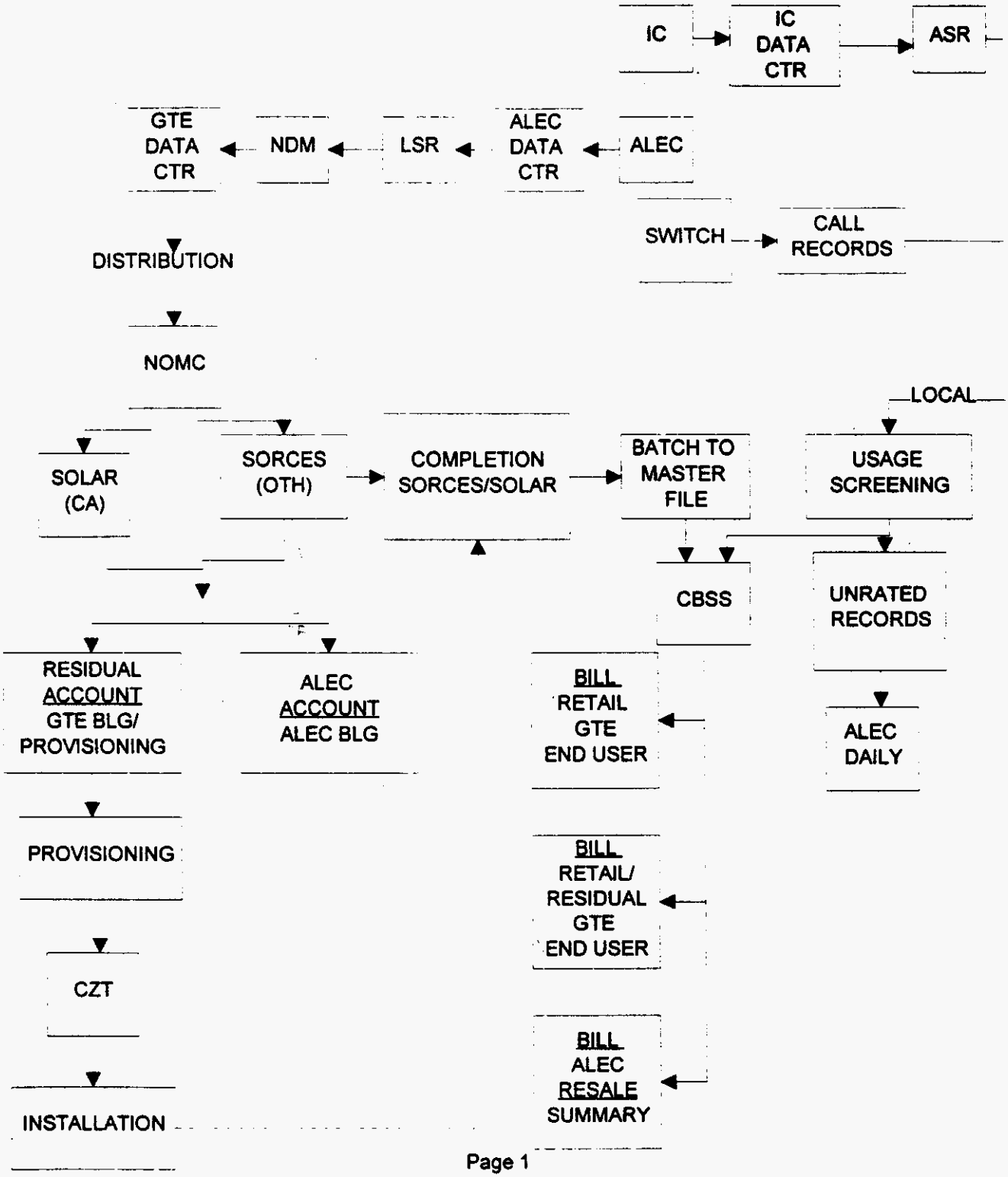
A. The Act allows AT&T and other requesting AECs to order and pay for access to GTE's operations support systems as an unbundled network element. GTE is willing to provide nondiscriminatory access to its operations support systems functions as required by the Act. However, such access will require the creation of certain electronic interfaces. These interfaces can be created, but AT&T and the ALECS must pay for them. Further, ample time must be allowed for this development depending on the amount of work which will be required.

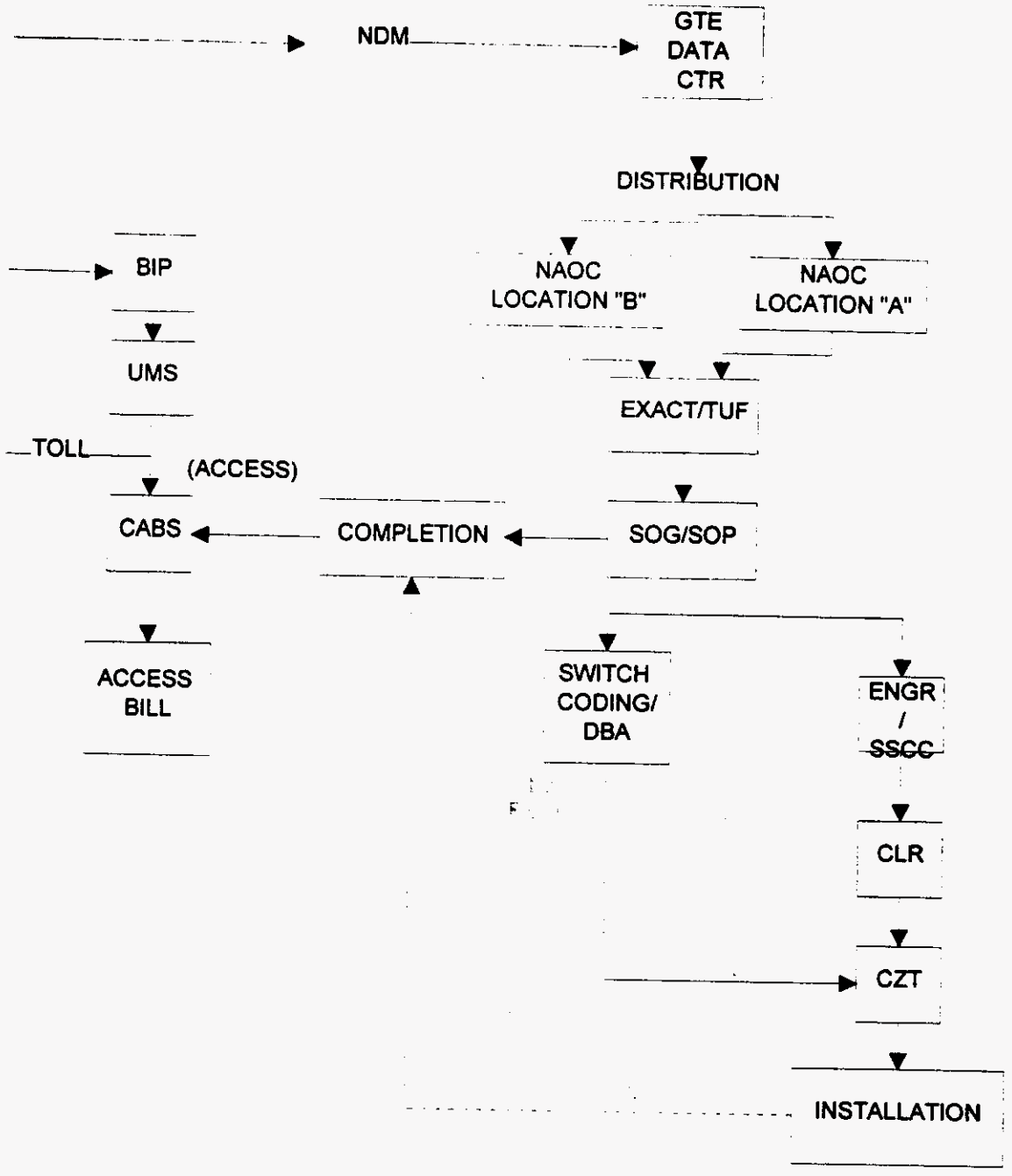
GTE should also be allowed to make PIC changes to AT&T local customers if requested. GTE should not be required to meet different standards for service quality, nor should it be required to remove its brand on its repair centers or for its repair employees. AT&T should be required to provide GTE billing information for its customers if AT&T desires GTE to bill for the third-party information service calls made by AT&T's local customers. Finally, GTE's customer account information is proprietary under the Act, and should not be disclosed to AT&T without the proper authorization.

**Q. DOES THAT CONCLUDE YOUR TESTIMONY?**

A. Yes, it does.

# LOCAL COMPLETION LINE-SIDE/TRUNK-SIDE PROCESS/SYSTEM FLOWS

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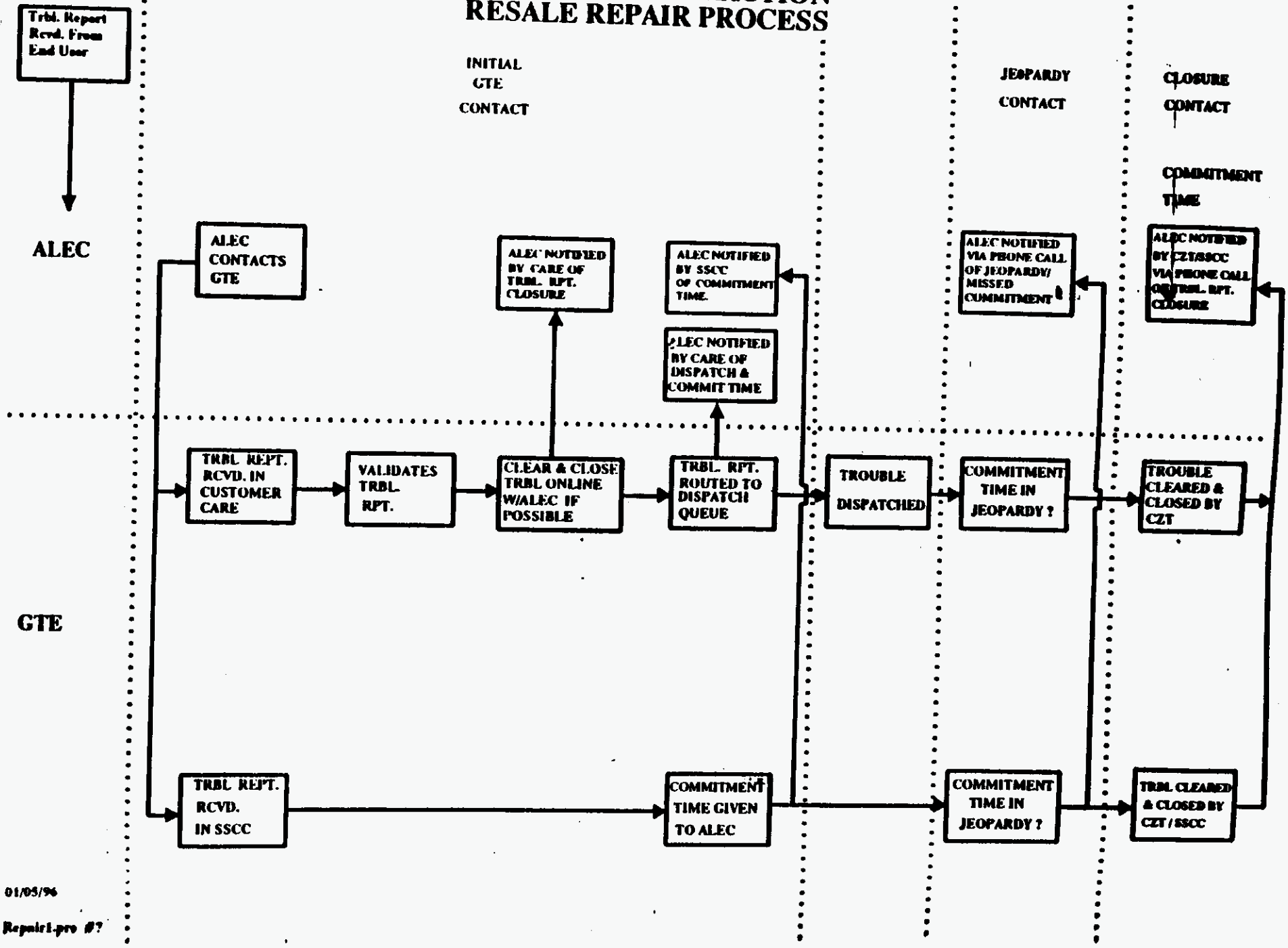
INSTALLATION

# ALEC/GTE INTERACTION
# RESALE REPAIR PROCESS




01/05/96

Repair1.pre #7

Docket No. 960847-TP
Direct Testimony of Rodney Langley
Exhibit No. RL-2
FPSC Exhibit No. ____
Page 1 of 1

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF BEVERLY Y. MENARD**

**DOCKET NO. 960847-TP**

**Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH GTE FLORIDA INCORPORATED (GTEFL).**

A. My name is Beverly Y. Menard. My business address is One Tampa City Center, Tampa, Florida 33601-0110. My current position is Regional Director - Regulatory and Industry Affairs.

**Q. WILL YOU BRIEFLY STATE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE?**

A. I joined GTEFL in February 1969. I was employed in the Business Relations Department from 1969 to 1978, holding various positions of increasing responsibility, primarily in the area of cost separations studies. I graduated from the University of South Florida in June of 1973 receiving a Bachelor of Arts Degree in Business Administration with an Accounting Major. Subsequently, I received a Master of Accountancy Degree in December of 1977 from the University of South Florida. In March of 1978, I became Settlements Planning Administrator with GTE Service Corporation. In January of 1981, I was named Manager-Division of Revenues with GTE Service Corporation, where I was responsible for the administration of the GTE division of revenues procedures and the negotiation of settlement matters

with AT&T. In November of 1981, I became Business Relations Director with GTEFL. In that capacity, I was responsible for the preparation of separations studies and connecting company matters. Effective February 1987, I became Revenue Planning Director. In this capacity, I was responsible for revenue, capital recovery and regulatory issues. On October 1, 1988, I became Area Director - Regulatory and Industry Affairs. In that capacity, I was responsible for regulatory filings, positions and industry affairs in eight southern states plus Florida. In August 1991, I became Regional Director - Regulatory and Industry Affairs for Florida. I am responsible for regulatory filings, positions and industry affairs issues in Florida.

**Q. HAVE YOU EVER TESTIFIED BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION?**

A. Yes. I have testified before this Commission on numerous occasions.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS DOCKET?**

A. The purpose of my testimony is to describe the open issues between GTE and AT&T Communications of the Southern States, Inc. ("AT&T") regarding AT&T's requests for local number portability ("LNP").

**Q. HAS THIS COMMISSION PREVIOUSLY CONSIDERED THE ISSUE OF INTERIM NUMBER PORTABILITY ("INP")?**

A. Yes. In Docket No. 950737-TP, the Florida Public Service Commission approved the use of Remote Call Forwarding (RCF) for INP. GTEFL filed tariffs reflecting the Commission's decision effective January 1, 1996.

**Q. WHAT ARRANGEMENTS IS AT&T REQUESTING FOR INTERIM NUMBER PORTABILITY?**

A. AT&T has requested four methods for interim number portability: 1) remote call forwarding ("RCF"); 2) Directory Number-Route Indexing ("DN-RI"); 3) Route Indexing-Portability Hub ("RI-PH"); and 4) Local Exchange Routing Guide ("LERG").

**Q. ARE THERE ANY OTHER ARRANGEMENTS WHICH COULD BE USED FOR INTERIM NUMBER PORTABILITY?**

A. Yes. Another arrangement referenced in the FCC Order (First Report and Order and Further Notice of Proposed Rulemaking in CC Docket No. 95-116 issued July 2, 1996 - the "Number Portability Order") and the FPSC Order is Flexible Direct Inward Dialing ("Flex-DID").

**Q. PLEASE DESCRIBE HOW REMOTE CALL FORWARDING CAN PROVIDE INTERIM NUMBER PORTABILITY.**

A. Remote Call Forwarding ("RCF") provides INP by assigning a

second 10-digit number to a customer and forwarding calls to that customer's new serving end office. When a customer has changed service providers but retains the current telephone number, calls placed to that number are first routed to the old provider's end office. At the old provider's end office, the telephone number is forwarded to the second number, which is located at the new provider's end office. The call is then routed to the customer's location.

RCF is a good choice for INP because it is a reliable, proven method that is available today. Thus, it is easily provided by a carrier without costly changes to ordering, billing and network systems. However, RCF has several drawbacks which make it more appropriate for use on an interim basis only. First, RCF requires one additional telephone number for each number that has been "ported" to a new service provider. This can be a major concern in densely populated regions where telephone numbers are being exhausted. Second, RCF will not allow many service features, such as some custom local area signaling services ("CLASS") features, to be operated over ported telephone numbers. Third, RCF results in an inefficient use of the network as all calls to ported numbers are first routed to the old service provider's end office, then to the new service provider's end office.

**Q. PLEASE DESCRIBE HOW FLEXIBLE DIRECT INWARD DIALING CAN PROVIDE INTERIM NUMBER PORTABILITY.**

A. Flexible Direct Inward Dialing ("Flex-DID") provides INP by sending calls to a ported number through a specific, dedicated trunk group between the old service provider's end office and the new service provider's end office. Calls to a ported number are routed to the old service provider's end office where they are routed directly to the appropriate Flex-DID trunk group.

Flex-DID, like RCF, is a good choice for INP because it is a reliable, proven method and is easily provisioned by service providers today without costly network modifications. In addition, Flex-DID does not require a second telephone number, as does RCF, and is thus code efficient. While calls are still routed to the old service provider's end office, calls are not routed a second time over the switched network to reach the new service provider's end office.

However, again like RCF, Flex-DID has drawbacks which confine it to INP. First, Flex-DID does not allow all service features, such as some CLASS features, to operate on ported telephone numbers. Second, Flex-DID continues to route all calls to the old service provider's end office first. Third, Flex-DID requires the use of additional trunk groups, thereby imposing an additional cost.

**Q. HOW CAN DIRECTORY NUMBER ROUTE INDEXING PROVIDE INTERIM NUMBER PORTABILITY?**

A. Directory Number Route Indexing ("DNRI") uses the existing network and switches to provide INP. However, DNRI does not use existing and available services. DNRI can be provided in either of two ways -- DNRI end office or tandem hubbing.

**Q. PLEASE DESCRIBE THE DNRI END OFFICE APPROACH.**

A. DNRI end office provides INP by sending calls to a ported number to the new service provider's end office through an interconnection trunk. This trunk is established directly between end offices. DNRI end office is favored by some carriers because it allows the telephone number to be ported over interconnection trunks, rather than the dedicated facility required by Flex-DID. The interconnection trunk can support other signaling messages and related voice/data transmissions and can be bi-directional. Moreover, DNRI end office does not require a second number, and thus uses numbering resources efficiently.

However, DNRI end office routing suffers from a number of drawbacks. First, DNRI end office does not allow all service features, such as certain CLASS features, to operate on ported telephone numbers. Second, DNRI end office continues to route all calls to the old service provider's end office first. Third,

though the network may be technically capable of providing DNRI, it is not an existing service for many of these service providers and is, therefore, not supported by existing ordering, provisioning and billing processes. As such, to provide DNRI end office, many service providers would have to modify their network systems supporting these processes, in addition to any network changes they might have to make. These costs are a major drawback for an interim service which will be replaced within the next few years. Finally, because the telephone number has not changed, DNRI end office requires the new service provider to open the old NXX code in its own end office to ensure that calls are not simply routed back to the network, where they would loop until the trunk capacity of one or more trunk groups is exhausted.

**Q. PLEASE DESCRIBE DNRI TANDEM HUBBING.**

A. DNRI tandem hubbing operates much like DNRI end office, but routes ported calls differently. The old service provider's end office routes the call to the end office's tandem switch, which then routes the call to the new service provider's end office over direct interconnection trunks. This is accomplished by adding a pseudo NPA code to the NXX which identifies the new service provider at the old service provider's end office. The tandem switch recognizes the pseudo NPA-NXX combination, routing the call to the direct interconnection trunk group of the new service provider. Each service provider using DNRI tandem hubbing thus

requires a unique NPA pseudo code to identify its interconnection trunk group.

DNRI tandem hubbing has all of the advantages and drawbacks of DNRI end office. An additional advantage is that DNRI tandem hubbing only requires one interconnection trunk group from the tandem switch to each of the end offices subtending the tandem switch. There are, however, several additional drawbacks. First, the pseudo NPA codes are part of the 1XX series of codes, which are currently used by local service providers for internal or local purposes and are not part of the administration of the NANP. Accordingly, there is no mechanism among companies for assigning or managing these codes and no way to assure standardization. Thus, different service providers would use the same codes to accomplish different functions in their networks. Second, the number of available 1XX codes may be insufficient to meet the demand for such codes. Third, due to the use of the tandem switch, DNRI tandem hubbing would require further modifications to ordering systems and impose additional costs to provide the service. Fourth, DNRI tandem hubbing reintroduces network inefficiency: the calls are routed to the old provider's end office, and are then routed out again, as with RCF.

**Q. PLEASE DESCRIBE HOW THE LOCAL EXCHANGE ROUTING GUIDE REASSIGNMENT METHODOLOGY MAY PROVIDE INTERIM NUMBER PORTABILITY.**

A. Local Exchange Routing Guide ("LERG") Reassignment has been suggested by AT&T as a method for INP. It is, more accurately, a proposed change to the industry standard for assigning and routing numbers to end offices.

The LERG is a document produced by Bellcore which lists routing information for end offices. The LERG is necessary because whenever a carrier receives a new NXX code and assigns this code to an end office, other carriers need to reprogram their end office switches to route calls to the end office with the new NXX. The LERG allows carriers to perform this important function by updating routing information on a monthly basis.

This routing information, and the switch programming needed to route calls, is formatted according to NPA-NXX codes, which is the industry standard. Thus, for example, if GTEFL opens a new NPA-NXX at one of its end offices, United Telephone Company would, when it received notice of the change in the next LERG, reprogram its switch to recognize the new NPA-NXX and route it to GTE's end office. United would not, however, need to include any information with regard to the XYYY digits -- only GTEFL

needs to have this information in order to route the call after it has reached the GTEFL end office.

**Q. HOW WOULD AT&T'S PROPOSAL CHANGE THIS INDUSTRY STANDARD?**

A. Instead of formatting LERG information on the basis of the NPA-NXX codes, AT&T has proposed formatting LERG information on the basis of NPA-NXX-X codes, thus adding the first digit of the four digit XYYY combination. Accordingly, where the current system allows one NPA-NXX code per end office, LERG Reassignment allows a single NPA-NXX code to be assigned to ten end offices. For example, under the current system, the 813-224 code is assigned to one end office owned by one carrier. Under LERG Reassignment, the 813-224 code could be assigned to ten end offices, from 813-224-0YYY to 813-224-9YYY. These ten end offices do not necessarily have to be owned by the carrier who once held the 813-224 code. However, each 813-224-X code can still only correspond to a single end office. Thus, it is correct to say that LERG Reassignment can reassign numbers to different carriers or end offices.

It is not correct, however, to say that because of this, LERG Reassignment is a method to provide INP. Even though the routing standard may change, LERG Reassignment itself could only change the carrier serving the number if it actually took a

customer away from GTEFL and gave that customer to a ALEC. For example, at present, the customer with telephone number 813-224-9999 is served by the GTEFL end office corresponding to 813-224. Under LERG Reassignment, each NPA-NXX-X could still only correspond to a single end office, so LERG Reassignment would have to split up the 813-224 numbers among carriers. GTEFL might receive 813-224-0YYY through 813-224-5YYY while a ALEC or group of ALECs would then receive 813-224-6YYY through 813-224-9YYY. The customer has the same number, but his carrier has changed without his consent unless the new carrier ported his number to a GTEFL end office. Alternatively, GTEFL could receive the 813-224-9YYY code, and continue to serve the customer. However, if the customer wanted to change to one of the other ALECs, he would have to change his number to the 813-224-X code served by that carrier or have his number ported to an ALEC end office.

Thus, LERG Reassignment is not a method of providing either INP or long-term number portability. It is a network routing standard that would require some other method of INP to function. To the extent any carrier proposes LERG Reassignment as a method of INP or long-term number portability, it is simply trying to advance its conception of efficient network routing standards rather than achieve any type of number portability that would be useful or cost efficient to the end user.

**Q. ASIDE FROM THE MATTER OF AT&T'S MISRERESENTATION OF LERG REASSIGNMENT AS AN INP METHOD, WHAT ARE ITS DRAWBACKS?**

A. Even if, somehow, LERG Reassignment were a method of INP, it would face significant disadvantages over any of the other methods described herein. Because the LERG is only updated once a month, INP for a given customer might not be available for up to four weeks or more after a request is made for the service. Furthermore, implementing LERG Reassignment would require the elimination of the industry standard for routing telephone calls and the implementation of an entirely new standard. This would entail the following costs, among others:

- all end office, tandem and other switches would have to be modified and reprogrammed to accept the new standard;

- each end office and tandem switch that connects to one end office via trunk lines under the current system would have to connect via ten trunks to cover the same series of numbers, entailing additional routing and capital costs;

- because billing and other operational support systems depend on vertical and horizontal coordinates for end offices that are based on NPA-NXX codes, these systems

would all have to be changed to an NPA-NXX-X format; and

- even if a customer does not want to change service providers, LERG Reassignment would nevertheless require INP for such customers if the customer's number was reassigned to another carrier.

As LERG Reassignment is, by no means, a method of providing INP, the following discussion will not generally refer to it and will assume that methods of providing INP refers predominantly to RCF, Flex-DID and either method of DNRI, and not LERG Reassignment, which will be separately discussed as necessary.

**Q. DOES THE TELECOMMUNICATIONS ACT OF 1996 ADDRESS NUMBER PORTABILITY?**

A. Section 251(b) of the Act requires all telecommunications carriers "to provide, to the extent technically feasible, number portability in accordance with requirements prescribed by the Commission." Number portability is defined by the Act as "the ability of users of telecommunications services to retain, at the same location, existing telecommunications numbers without impairment of quality, reliability, or convenience when switching from one telecommunications carrier to another." (Act at § 153(30).) With regard to pricing of number portability, the Act states that "[t]he

cost of establishing . . . number portability shall be borne by all telecommunications carriers on a competitively neutral basis as determined by the [FCC]." (Act at § 251(e)(2).)

In July 1996, the FCC released its regulations regarding number portability. (See Number Portability Order.) The FCC regulations establish a schedule whereby telephone companies will be required to implement long-term number portability using database methods. (Number Portability Order at ¶¶ 77-81.) With regard to INP, the Number Portability Order held that "currently RCF and Flex-DID are the only methods technically feasible," and thus required local exchange carriers "to offer number portability through RCF, Flex-DID and other comparable methods . . . ." (Number Portability Order at ¶ 110) [these are the only criteria established by the FCC with regard to INP. The FCC established nine performance criteria for long-term number portability, but did so solely in that context. (See Number Portability Order at ¶ 48.)]

The FCC regulations also establish guidelines for State commissions to follow in setting the rates for INP. Alternatively, however, the State commission may require carriers to file a tariff, in which case the guidelines do not necessarily apply. (Number Portability Order at ¶ 127.) With regard to the FCC's guidelines, the FCC defines the cost of providing INP as being the

"incremental cost incurred by a LEC to transfer numbers initially and to subsequently forward calls to new service providers using existing RCF, Flex-DID, or other comparable measures." (Number Portability Order at ¶ 129.) The FCC provided that any mechanism for the recovery of these costs must be "competitively neutral," meaning that it must meet two criteria. First, it "should not give one service provider an appreciable, incremental cost advantage over another service provider, when competing for a specific subscriber." (Number Portability Order at ¶ 132.) Second, it "should not have a disparate effect on the ability of competing service providers to earn normal returns on their investment." (Number Portability Order at ¶ 135.) Furthermore, assuming that ILECs will win customers away from CLECs, just as CLECs will win customers from ILECs, the FCC held that competitive neutrality requires a "reciprocal compensation arrangement" with the rate paid by the ILEC to the CLEC equal to that paid by the CLEC to the ILEC. (Number Portability Order at ¶ 137.)

**Q. DOES GTE AGREE WITH AT&T'S REQUEST FOR INP USING EITHER DNRI OR LERG REASSIGNMENT?**

A. No. DNRI is not currently available over GTEFL's network and would entail a significant investment for a network system that will be obsolete in a few years. LERG Reassignment is not a method of INP.

**Q. WHY CAN'T GTEFL IMMEDIATELY PROVIDE DRNI AS REQUESTED BY AT&T?**

A. GTE cannot provide INP using DNRI tandem hubbing or DNRI end office without significant additional modifications to its databases and support systems. GTE's ordering, billing and provisioning systems do not currently support either method of DNRI. They would all have to be modified at a significant cost. Furthermore, either method of DNRI would require additional investment in GTE's network. DNRI end office requires the addition of interconnection trunks between GTE's and AT&T's end office switches. These interconnection trunks might not otherwise be added to the network. DNRI tandem hubbing requires an additional switching functionality at both the end office and the tandem switch in order to add the necessary NPA pseudo code, translate the code and then remove it at the tandem switch. The costs above, of course, are measured not only in terms of the cost of equipment, but also the cost of technical expertise and labor devoted to implementation.

Thus, if GTE were required to provide either method of DNRI to AT&T, it would be forced to absorb a large expense in order to implement a system that will only be in use for a short time -- GTE and other carriers must begin implementing long-term number portability methods as soon as October 1, 1997. (Number Portability Order at ¶¶ 77, 110.) GTE's experience in

Oregon with DNRI end office is instructive in this respect. GTE was ordered to provide INP using DNRI end office in Oregon in June 1996. GTE anticipates, although it cannot be certain, that it will be able to offer INP in Oregon only using this method in October 1996. After DRNI is implemented in Oregon, GTE will then be able to determine the feasibility and cost to implement DNRI end office.

**Q. SINCE GTEFL ALREADY HAS TARIFFS IN PLACE FOR RCF, SHOULD ANY CHANGES BE CONSIDERED IN THE RATES FOR RCF IN THIS DOCKET?**

A. No. As discussed previously, in the Number Portability Order, the FCC has stated the State commission may require carriers to file a tariff, in which case the guidelines do not necessarily apply. (Number Portability Order at ¶ 127.) In addition, since this issue affects all LECs and ALECs, hearings are already scheduled in Docket No. 950737-TP to address this issue on November 25, 1996. GTEFL will be filing testimony in that proceeding addressing the issue of competitive neutrality with respect to the pricing for interim number portability.

**Q. DOES GTEFL HAVE ANY OTHER CONCERNS WITH AT&T'S REQUEST FOR INTERIM NUMBER PORTABILITY?**

A. Yes. Attachment 8 in the Interconnection Agreement filed by AT&T contains AT&T's proposed contract language for local

number portability. Paragraph 2.1 states that "AT&T shall not be required to order any additional paths to handle multiple simultaneous calls to the same ported telephone number." This is not consistent with the FPSC Order or GTEFL's tariffs.

In addition, Paragraph 4.6.2 states that "GTE shall supply AT&T with individual call records, with full call detail, that provide billing information associated with the RCF second leg call." The issue of meet-point billing is discussed in the FCC's Number Portability Order to insure that both carriers have the proper access billing arrangement. GTE endorses the principle that the forwarding and terminating carrier should share in the access charges, since both carrier's facilities are used to terminate the interexchange call. However, incumbent LECs should not be required to implement costly changes to billing systems and switch software for a short-term investment that will have no continuing utility for the implementation of long term number portability. GTE has filed a Petition for Reconsideration in CC Docket No. 95-116 on this issue and would request that the Commission not order this costly modification to GTEFL's systems.

**Q. DOES GTEFL AGREE WITH AT&T'S REQUEST FOR A LONG TERM NUMBER PORTABILITY SOLUTION IN THIS PROCEEDING?**

A. GTEFL does not understand why this issue is part of AT&T's arbitration request. This Commission has established Docket No.

960100-TP to consider a long term number portability solution in Florida. GTEFL is an active participant in this docket. In addition, the FCC's Number Portability Order requires implementation of a long term number portability solution beginning in third quarter 1997. In the FCC Order, the Tampa MSA is scheduled for conversion in first quarter 1998 and the Sarasota MSA is scheduled for conversion in fourth quarter 1998.

In short, GTEFL believes this arbitration proceeding is complex enough without adding issues that are already slated for resolution elsewhere.

**Q. WOULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?**

A. Yes. RCF is a currently available method for providing number portability that will provide AT&T with the full benefit of INP, with the least amount of modification to GTEFL's current network. While RCF is, admittedly, subject to disadvantages that make it unfit for long-term portability, GTEFL believes that these disadvantages do not preclude the use of RCF for INP. Furthermore, as RCF is currently available, it will not require the significant additional capital investment that the use of DNRI would require. Even using RCF, however, GTEFL will incur significant costs that it is entitled to recover. Even if competitive neutrality is applicable to cost recovery for INP, GTEFL and all other carriers should be able to recover their tariffed rates to the

extent such tariffs have already been filed or, alternatively, recover the costs of INP through a cost pooling system.

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

A. Yes, it does.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF GREGORY M. DUNCAN**

**DOCKET NO. 960847-TP**

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

A. My name is Gregory Michael Duncan. My business address is 555 South Flower St. Suite 4100, Los Angeles CA 90071.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed by National Economic Research Associates as Vice President. Before that, I worked for GTE Laboratories, Inc. with the Department of Economics and Statistics where I was a Staff Scientist; a position reserved for a small number of independent researchers with responsibility for developing, proposing and conducting research as well as supervising the research of other economists and statisticians at GTE Labs.

**Q. PLEASE DESCRIBE YOUR EDUCATION AND PROFESSIONAL BACKGROUND AND EXPERIENCE.**

A. I received a M.A. in Statistics in 1974 and a Ph.D. in Economics in 1976, both from the University of California, Berkeley. Beginning in 1975, I taught in the Economics Department and Statistics Program at Northwestern University in Evanston, IL, where I was an Assistant Professor of Economics and of

Statistics. There, my teaching included demand and production theory, econometrics and statistics. I also conducted research on demand and production that appeared in refereed journals. I left Northwestern in 1979 to join the faculty at Washington State University. There, I served as Professor of Economics and of Statistics. My research continued in demand, production theory and applications as well as in other topics. During that period, I was one of the first Associate Editors of the academic journal *Econometric Theory*. I have published many refereed papers in cost, production, and demand analysis, including the results of the research that supported other testimony before a number of regulatory commissions. During my career, I have spent a good part of my time working on the analysis of cost data and have been fortunate enough to be able to contribute much of it to the academic literature on costs and production. My papers in this area appear in the *International Economic Review, Proceedings of the National Academy of Sciences, Econometrica,* and the *Journal of Risk and Uncertainty.* In addition, under my supervision, a number of Ph.D. students at Northwestern University, Washington State University and Boston University wrote dissertations that utilized modern cost and production methods. The results of some of these dissertations have also been published as contributions to the economics profession's understanding of costs. My particular expertise includes the formulation, specification, estimation and testing of cost models.

And, as a consequence, I was asked to teach and have taught numerous graduate level courses that covered directly and indirectly all aspects of cost analysis.

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

A. The purpose of my testimony is to provide an economic evaluation of Version 2.2 of the Hatfield Model. This costing model is relied upon by AT&T witness, Don J. Wood, in AT&T's Petition for Arbitration against GTE Florida Incorporated. This evaluation is attached to my testimony and is marked as Exhibit No. GMD-1. In that evaluation, I describe how the Hatfield Model is fundamentally flawed and why it does not provide reasonable estimates of the costs of incumbent local exchange carrier network elements. I also describe the shortcomings of the model and conclude that, because of those shortcomings, the model understates the cost of loop plant and local switching by about $6.00 per line per month. The Hatfield Model bases prices on costs that no real-world provider could hope to meet, and as such, is anti-competitive and stifles rather than promotes facilities-based competition, which is the most effective type of competition. In addition, because the Hatfield Model requires LECs to sell inputs at non-compensatory rates, it has the deleterious effect of forcing whatever customers that may remain with the LEC to subsidize the below-cost input prices and severely

handicap firms that represent a substantial proportion of the telecommunications industry.

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

A. Yes, it does.

Docket No. 960847-TP
Direct Testimony of Gregory M. Duncan
Exhibit No. GMD-1
FPSC Exhibit No. _____

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# ECONOMIC EVALUATION OF VERSION 2.2 OF THE HATFIELD MODEL

by

Gregory M. Duncan

and

Timothy J. Tardiff

**September 6, 1996**

## EXECUTIVE SUMMARY

Version 2.2 of the Hatfield Model is fundamentally flawed, and therefore does not provide reasonable estimates of the costs of incumbent local exchange carrier (ILEC) network elements. Particular shortcomings of the model fall into two major areas. First, the model has never been directly empirically validated. By this we mean that the predictions of the model have never been compared to actual observable data to see how well the model predictions comport with reality. Second, the model fails direct internal consistency checks of its validity, indirect comparisons of its validity by comparison of its results to cost models that do depend on real data, and is based on a set of restrictive assumptions whose lack of realism would try the confidence of even the most partisan proponent. Particular shortcomings of the model include the following.

- The model is based on static notions of cost rather than the dynamic notions that are relevant to regulations that seek to emulate the workings of dynamic competitive markets.
- There is no attempt at empirical validation of the model or its predictions.
- Its predictions fail explicit internal consistency requirements that are a necessary feature of structures capable of representing the minimum cost of producing telecommunications services using the most efficient forward-looking technology[1].
- Its predictions do not agree with other industry models that are based on firm specific data.
- The assumption that all volumes currently served by local exchange carriers will be served by a brand new entrant that instantly materializes is inconsistent with both reality and sound economics. Accordingly, costs based on such a model will *not* be

[1] By the most efficient forward looking technology, we mean the least cost technology taking the installed network as a base and building from that using the least cost technology available for producing the services required. Ignored in most "greenfield" or "scorched node" arguments is that to actually use them one would have to tear up useful plant. None of these methods take into account either the direct or indirect costs of such a strategy.

representative of the costs incumbent LECs incur providing services and unbundled networks components.

- The inputs (e.g., central office equipment prices) are consistently lower than what local exchange companies actually pay.

This report evaluates a number of additional, specific shortcomings of the model, including (1) the use of Census Block Groups to represent distribution plant, (2) the misuse of utilization (fill) factors, (3) the understatement of local switching costs, and (4) the understatement of the cost-of-capital and the rates of depreciation that will prevail under competitive conditions when network elements are offered on an unbundled basis. The cumulative impact of these various effects is that the Hatfield model understates the cost of loop plant and local switching by about one-third. Stated on a per line basis, the Hatfield model understates loop and local switching costs by about $6.00 per month.

Of course, the ultimate concern is how network elements are unbundled in a way that promotes competition. Basing prices on costs that no real-world provider could hope to meet is *anti-competitive*, because it would stifle, not promote, the most effective type of competition—facilities-based. In addition, requiring incumbent LECs to sell inputs at non-compensatory rates would have the deleterious effects of forcing whatever customers that may remain with the LEC to subsidize the below-cost input prices and/or severely handicapping firms that represent a substantial proportion of this dynamic industry.

# I. INTRODUCTION

In its May 16, 1996 comments and May 30, 1996 reply comments in the Federal Communications Commission's (FCC) Local Competition Investigation, AT&T introduced Version 2.2 of the Hatfield model.[2] On June 14, 1996, AT&T and MCI filed the same model in the unbundling proceeding in California.[3] The purpose of this paper is to demonstrate that the Hatfield model does *not* provide reasonable estimates of the costs of local exchange company (LEC) network elements, either for LECs in general or any particular LEC, because the model (1) departs from fundamental economics in a number of significant ways, (2) contains a number of inaccuracies in execution that depart from reality, (3) produces results that are inconsistent with what can actually be observed, and (4) implies a fantasy version of both regulation and functioning markets.[4]

Particular shortcomings of the model include the following:

- The model is based on static notions of cost rather than the dynamic notions that are relevant to regulations that seek to emulate the workings of dynamic competitive markets.
- There is no attempt at empirical validation of the model or its predictions.
- Its predictions fail explicit internal consistency requirements that are a necessary feature of structures capable of representing the minimum cost of producing telecommunications services using the most efficient forward-looking technology.

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[2] The Hatfield model is somewhat of a moving target. For example, MCI introduced a different ("greenfield") version of the model in its May 16 comments (Hatfield Associates, Inc., "The Cost of Basic Network Elements: Theory, Modeling, and Policy Implications"). Versions of the model have received extensive attention in ongoing universal service and unbundling proceedings in California.

[3] We understand that the model has been filed in a number of other states as well.

[4] Given the recent release of the Hatfield model and the constant changes made by the proponents, our evaluation is preliminary in nature, and will undoubtedly uncover more errors. As we understand it, working versions of Version 2.2 Release 1 only became available in late June. We received a working version of Version 2.2 Release 2 on August 26. The model is extremely complex and has limited and incomplete documentation.. As a consequence, a thorough evaluation is necessarily time-consuming and so it was not possible within the time period available for our evaluation. One must also ask how many more releases are in the offing.

- Its predictions do not agree with other industry models that are based on firm specific data.

- The assumption that all volumes currently served by local exchange carriers will be served by a brand new entrant that instantly materializes is inconsistent with both reality and sound economics. Accordingly, costs based on such a model will *not* be representative of the costs incumbent LECs incur providing services and unbundled networks components.

- The inputs (e.g., central office equipment prices) are consistently lower than what local exchange companies actually pay.

## II. EXTERNAL VALIDITY

We begin with the most vexing of the many problems accompanying the Hatfield Model. That is its lack of independent or external verification. Whether estimating costs using a pure econometric approach, a pure engineering approach or some hybrid approach, common practice requires validating a model by comparison to real world phenomena.

Ideally, a model such as the Hatfield Model would be calibrated or estimated using cost data from a source similar to those desired to be predicted. For example, the typical cost model would attempt to minimize differences in its predictions and real world data. If TS/TELRICs were readily available and observable for a number of firms over a period of time, then the model would be calibrated using all of the data from a subset of the firms, presumably a group of firms representative of the group whose TS/TELRICs we wish to predict. The model developed during this phase would then be subjected to a validation test, that being a comparison of the predictions of the model for firms left out of the calibration subset to the actual TS/TELRICs of those firms. For example if there were data on five or six firms one might hold out the data for two of them and calibrate the cost model on the basis of the other four. Then the model would be used to predict the TS/TELRICs for the two firms held out. The validity of the model would be judged by comparing the predictions of the model with the data that obtained in the real world for the firms in the validation data set using a variety of well known and widely accepted criteria.

This ideal procedure is not always followed, of course. Data are precious and expensive; so often other types of validation are used where the whole data set can be employed in the calibration or estimation phase. Again the methods are well known and need not concern us here because the Hatfield model is not based on sampling data nor has it ever been validated to our knowledge. Consequently, its validity or lack thereof must be judged on other grounds. These include the realism of the model's assumptions, comparison of the results to those produced by other models, and the extent to which the model satisfies internal validity checks. The model will be shown to fail miserably in these other criteria, leaving absolutely no basis supporting the model.

The rest of the paper is divided into two parts. The first part concentrates on the realism of the assumptions and comparison of Hatfield Model outputs to those of other cost models. The second part demonstrates that the Hatfield Model is theoretically incapable of representing the minimum cost of producing telecommunications services using the most efficient forward looking technology.

## III. ECONOMIC THEORY

The Hatfield model documentation characterizes the model as "scorched node"—it starts with the existing locations of central offices, then builds a brand new system instantaneously from the ground up. While proponents of this approach claim that it approximates the textbook definition of long-run cost, it is grossly at odds with how real businesses incur costs, especially capital-intensive firms that expand their facilities by adding capacity in discrete modules.[5] Almost five years ago, Professor Alfred Kahn advised the FCC of the need to employ a realistic and practical perspective.

[5] Even the theoretical definition must be conditioned by reality. For example, Professor Varian has noted: "Long run and short run are of course relative concepts. Which factors are considered variable and which are considered fixed depends on the particular problem being analyzed. You must consider over what time period you wish to analyze the firm's behavior and then ask what factors can the firm adjust during that time period." Hal R. Varian, *Microeconomic Analysis, Third Edition*, New York: Norton, 1992, p. 66.

> In strict economic terms, the concept of long-run marginal costs relates to a hypothetical situation in which all inputs are variable, and a supplier confronts the possibility of installing entirely new facilities, in effect from the ground up. And the "marginal" relates to the incremental cost of a single unit of output. The concept of long-run incremental cost, in contrast, is more pragmatic: it takes a firm's past history as given, does not assume that it is writing on a blank slate, but recognizes that it will ordinarily be planning the installation of new capacity, at whatever that additional investment will cost given its current situation, and it spreads the costs over either the total output of that additional capacity—in that sense it is a kind of average incremental cost—or over the additional output that is likely to be induced by a price reduction under consideration (or curtailed in response to a price increase.)[6]

An additional difficulty with the Hatfield scorched view of the world is that it ignores the fact that in an industry with technological change, which clearly characterizes telecommunications, no company would set prices based upon such costs. The reason is that when technology advances, a new entrant taking advantage of latest technologies would drive prices down. Basing prices on the Hatfield view of the world would never recover costs. Professor Kahn and Dr. Tardiff recently noted this phenomenon as follows:

> In a world of continuous technological progress, it would be irrational for firms constantly to update their facilities in order completely to incorporate today's lowest-cost technology, as though starting from scratch: investments made today, totally embodying today's most modern technology, would instantaneously be outdated tomorrow and, in consequence, never earn a return sufficient to justify the investments in the first place. For this reason, as Professor William J. Fellner pointed out many years ago, firms even in competitive industries would systematically practice what he calls "anticipatory retardation," adopting the most modern technology only when the progressively declining real costs had fallen sufficiently below currently prevailing prices as to offer them a reasonable expectation of earning a return on those investments over their entire economic life. In consequence even perfectly competitive prices would not be set at the level of these (totally) current costs—unless, to put it another way, the calculated costs of the new plant included an extremely high rate of return and of depreciation, in reflection of the exposure of any such

[6] Affidavit of Alfred E. Kahn, Before the Federal Communications Commission, In the Matter of Expanded Interconnection with Local Telephone Company Facilities, CC Docket No. 91-141, August 6, 1991.

investments to costs and prices progressively declining in real terms over their life.[7]

The Hatfield model's scorched approach to cost modeling essentially assumes that a LEC's loses one hundred percent of its demand for telepone services on day one. In effect, the succession of incumbent LECs would hand over their entire business to the newcomer, which in turn would instantly size its plant to perfectly accommodate this demand, taking advantage of all the economies that come with serving the demand with perfectly sized facilities obtained at the maximum volume discounts. It would be nice if the world worked this way, because we would all like to pay less for what we consume. Unfortunately, it does not. A real firm grows to meet demand as it materializes. As such, it adds capacity taking into account the trade-off between the lower per unit costs of bigger modules (e.g., larger cable sizes) and the costs of carrying the unused capacity that deploying larger modules would entail.

In short, the Hatfield model creates a contradictory world in which both full competition and the scale economies that would ordinarily dictate a monopoly structure coexist:

- Only a single firm can enjoy the economies of scale from deploying larger modules and the high capacity utilization from efficient inventory management.

- The firm is subject to the cost reducing effects of using the latest technology, while at the same time its equipment depreciates at regulatory-prescribed rates and its cost-of-capital is the same as for regulated utilities and it is guaranteed the full level of demand that a monopoly carrier would enjoy. Unfortunately, as discussed by Dr. Hausman, competitive markets are inconsistent low depreciation rates, guaranteed demand and guaranteed returns.

[7] Declaration of Alfred E. Kahn and Timothy J. Tardiff, Before the Federal Communications Commission, In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996, CC Docket No. 96-98, May 30, 1996. (footnote omitted). Professor Jerry Hausman's reply affidavit, filed in this docket on the same day, makes a similar point in the context of depreciation. Professor Hausman's findings will be discussed later when depreciation issues are addressed.

## IV. SPECIFIC COMPONENTS OF HATFIELD MODEL

The Hatfield model reports results for several networks components: (1) loops, (2) local switching, (3) signaling, (4) transport, and (5) operator systems. Because the first two components constitute a substantial proportion of the total cost and have been subject to more extensive examination in the California proceedings than the other components, our review focuses on these components.

### A. Loops

For the most part, the Hatfield model's development of loop costs relies on an incompletely documented revision to the Benchmark Cost Model (BCM Plus). The original model (BCM1) has been filed with the FCC by MCI, NYNEX, Sprint, and U.S. West. BCM1 identified geographic areas where costs of basic residential access service are relatively high or low cost. The sponsors describe their model as follows.

> The BCM does not define the actual cost of any telephone company, nor the embedded cost that a company might experience in providing telephone service today. Rather the BCM provides a benchmark measurement of the relative costs of serving customers residing in given areas, i.e., the CBGs [Census Block Groups].[8]

What is noteworthy about this description of purpose is that the costs that the BCM produces are not the actual costs of any particular company. Despite this acknowledgment by the BCM's sponsors, the proponents of the Hatfield model incorrectly propose to use parts of the BCM, albeit revised, to produce actual prices for the incumbent LEC's unbundled elements.

The BCM starts with the current locations of the LEC's central offices. The model constructs loop plant (feeder, distribution, and associated structures) from the central office locations to the households in the CBG by means of specific engineering rules, e.g., the lines served by a particular central office are the result of assigning CBGs to the closest wirecenters.

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[8] MCI Telecommunications Corporation, NYNEX Corporation, Sprint Corporation, and US West Inc., "Benchmark Cost Model," Submitted to the FCC, CC Docket No. 80-286, September 12, 1995, p. 3.

This assignment does not necessarily assign the households within the CBG to the wire center that actually serves them. For example, in California, Pacific Bell and GTE have found that the BCM assigns substantial percentages of households to the wrong wirecenter. As a result, the network represented by the BCM departs from the LEC's actual network. The Hatfield model's proponents may argue that the BCM has assigned households more efficiently than the LECs have. A more likely explanation is that the extremely abstract representation of the network—a featureless plain[9]—ignores real world constraints, such as physical barriers, e.g., rivers, lakes, and hills, between a CBG and its closest central office.

Because the BCM assumes that loop facilities are installed instantaneously, the model selects the largest available cable sizes to serve a given static volume. In contrast, because real networks evolve as demand grows and changes, firms face a trade-off between deploying larger cable sizes (and enjoying the economies of scale that result at or near full capacity) versus using smaller sizes, thus reducing the carrying costs of the extra inventory that large cable sizes entail. In this regard, the BCM may underestimate loop cost, because it could assign larger/less costly facilities (on a per-unit basis) than an efficient firm would deploy. Such "savings" are illusory, not real. What has been left out of the BCM is the carrying charges on the unused capacity that the larger cable sizes would require for several years, until actual demand materializes.

A number of calculations built into the BCM can produce inaccurate estimates of efficient loop costs.

### 1. Installation and Structure Costs

For loop plant, both feeder and distribution, BCM1 calculates the investment costs of installation and structures by multiplying the cost of cable by factors that represent the installation labor cost and support structure investments. While properly developed factors can give reasonable representations of average installation and structure costs if current conditions

[9] The only distinguishing characteristics are a number of topological factors used to estimate the cost of installation and support structures.

are similar to those from which the factors were based, problems can arise when conditions change. In particular, changes in the cost of cable pass through directly into changes in the cost of installation and structures. In other words, the model would predict that two otherwise identical areas would have different installation and structure costs if they were served by companies that paid different amounts for their cable. Similarly, the model would predict that cost of installation and structures would decrease when a company is able to secure a better discount on the cost of the cable itself.

Hatfield's BCM Plus separately estimates the cost of structures, thus potentially overcoming the conceptual flaw in BCM1. Of course, the accuracy of the estimates depend heavily on the use of correct input prices for structures. We understand that for at least one such structure—manhole structures—the default prices contained in the model are considerably lower than at least one LEC actually pays. This type of inaccuracy is of more than academic interest; installation and structures can account for upwards of 80 percent of loop costs. In fact, a reasonable sanity check on the structure cost inputs would be to ascertain whether the share of loop costs accounted for by structures reasonably approximates real world experience.

### 2. Modeling Distribution Facilities

The BCM constructs feeder plant from the central office to the edge of the CBG. All loop plant within a CBG is assumed to be distribution plant. The BCM assumes that CBGs are square in shape and that households are uniformly distributed over the area of the CBG, neither of which is true of real CBGs. The BCM also uses an abstract representation of the distribution plant within a CBG. CBGs in the same density class have the same number of distribution cables of length equal to 62.5 percent of the square-root of the area of the CBG.[10]

The abstract representation of distribution plant can produce results that differ from reality, i.e., loop lengths can be inaccurate, cable sizes can be incorrect, and the number of cables within a CBG can differ from the number of cables assigned by the BCM.

[10] The model assumes that CBGs are square. Therefore, the square root of the area is the side of the square.

First, as the sponsors of the CBG acknowledge, in sparsely populated areas, the uniform distribution assumption can cause substantial errors in cost estimation.[11] The basic problem is that the average loop length depends on the distribution of households within an area. When the assumed distribution differs from the actual, an average based on the former will be inaccurate.

Second, although the BCM documentation describes CBGs as containing on average 400 households, there is, in fact, considerable variation in the number of households within a CBG. The consequence is that CBGs with a large number of households exceed the size of the distribution areas that at least one LEC, Pacific Bell, employs. In turn, the BCM allows larger copper cable sizes than the LEC actually employs. In particular, Pacific's maximum feeder cable is 3,600 pairs (GTE's maximum size is 3,000 pairs), compared to the 4,200 maximum in the BCM. For distribution cable, the corresponding values are 1,800 and 3,600 for Pacific and the BCM, respectively. If support structure can accommodate larger cables, there are economies in larger cable sizes. Because Pacific has found that its support structures cannot accommodate the largest cables assumed by the BCM, the BCM's default assumptions would understate the true cost of Pacific's loop plant.

Third, the use of the same number of distribution cables in a density class can cause substantial bias.[12] In fact, GTE examined the impacts of doubling the number of distribution cables from four to eight, accounting for installation and structural costs the way they are actually incurred. The estimated increase in cost was 49 percent.

Finally, the representation of the interface between the distribution cable and the subscriber (the drop wire and subscriber terminal) is not described in the Hatfield model documentation. The cost assumed for drop wire may be inconsistent with drop wire lengths that are compatible with the number of distribution cables employed in the model. For example, under a particular geometric representation of the distribution cables and drop wire, four

[11] BCM, p. 38.

[12] BCM1 used exactly four distribution cables per CBG. BCM Plus apparently varies the number of cables by density class, although no documentation on the actual numbers has been provided.

distribution cables (as used in BCM1) implies an average drop wire length would be about 25 percent of the distribution cable length. In contrast, GTE estimates that the cost employed in the Hatfield model implies a drop distance of only about 25 feet, which is considerably shorter than 25 percent of the average length of distribution cable. For example, for a low density CBG of one square mile, one-quarter of the BCM1's distribution cable length is 3/16 of a mile. GTE estimates that the drop wire investment for this length to be about $1,700 in California.[13] This is equivalent to a monthly cost of $32, which is about 55 percent of the Hatfield model's loop cost in the lowest density group (0 - 5 households per square mile) in California.

The abstract nature of the BCM's distribution model is of more than academic interest. In the network cost elements produced by Release 2, distribution plant accounted for 39 percent of the total cost of switched network elements in California. Percentages are similar in other states, e.g., distribution plant accounts for 42 percent of Hatfield's total cost for switched network elements in Texas.

### 3. Fill Factors[14]

Because telephone capacity is modular, i.e., it comes in sizes greater than a single unit, there is more capacity in place than volumes in service. Capacity exceeds volume even when the most efficient engineering practices are followed. The ratio of volume in service to capacity is the fill factor.

The spare capacity represented by a fill factor less than 1.0 is a *current* economic cost of providing service. In a previous evaluation of the BCM, Pacific Bell's cost experts in reviewed that model.[15] As part of that review of the BCM engineering rules, Pacific's experts compared

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[13] Despite the likelihood that changing the number of distribution cables (as well as an apparent change in the average distribution cable length) would change the drop length, no change in the default values for drop wire have been made in the latest version of the Hatfield model.

[14] A theoretical discussion of these issues appears in Richard D. Emmerson, "Theoretical Foundation of Network Costs," in W. Pollard, editor, *Marginal Cost Techniques for Telephone Services*, National Regulatory Research Institute, 1991, pp. 145-189.

[15] Timothy J. Tardiff, "Evaluation of the Benchmark Cost Model," prepared on behalf of Pacific Bell, for filing with the California Public Utilities Commission, Rulemaking/Investigation on the Commission's Own Motion (continued...)

the model's fill factors with the actual fill factors that would result from the best engineering practices. In general, the fill factors for feeder plant in the BCM were moderately higher than best practice and the fill factors for distribution plant in high density areas were substantially higher than best practice. Distribution fill factors are relatively low because of the high cost of adding capacity after the support structure has been built. Accordingly, capacity for an indefinitely long planning horizon is installed initially and utilization of that capacity is low as a result.

Unfortunately, Version 2.2 of the Hatfield model has increased the already somewhat high distribution fill factors in the original BCM, as shown in the table below. This would cause the underestimation of loop costs to be even greater.

| | **BCM** | | **Hatfield** | |
|---|---|---|---|---|
| Density Zone | Feeder | Distribution | Feeder | Distribution |
| 1 | 0.65 | 0.25 | 0.65 | 0.50 |
| 2 | 0.75 | 0.35 | 0.75 | 0.55 |
| 3 | 0.80 | 0.45 | 0.80 | 0.60 |
| 4 | 0.80 | 0.55 | 0.80 | 0.65 |
| 5 | 0.80 | 0.65 | 0.80 | 0.70 |
| 6 | 0.80 | 0.75 | 0.80 | 0.75 |

The Hatfield model's use of unrealistically high fill factors causes costs to be understated because the fill factor, in part, determines how much cable is needed. The Hatfield model

(...continued)

into Universal Service and to Comply with Mandates of Assembly Bill 3643, R.95-01-020/I.95-01-021, December 1, 1995.

appears to be based on the belief that competitive firms would have minimal spare capacity. In this regard, the FCC's finding on spare capacity in interstate long-distance, which was one of the bases for granting AT&T non-dominant status, contradicts this apparent belief:

> AT&T asserts, and no one disputes, that MCI and Sprint alone can absorb overnight as much as fifteen percent of AT&T's total 1993 switched demand at no incremental capacity cost; that within 90 days MCI, Sprint, LDDS/Wiltel, using their existing equipment, could absorb almost one-third of AT&T's total switched capacity; or that within twelve months, AT&T's largest competitors could absorb almost two thirds of total switched traffic for a combined investment of $660 million. Thus, AT&T's competitors possess the ability to accommodate a substantial number of new customers on their networks with little or no investment immediately, and relatively modest investment in the short term. We therefore conclude that AT&T's competitors have sufficient excess capacity available to constrain AT&T's pricing behavior.[16]

To cast the FCC findings in terms relevant to the current discussion, note that MCI and Sprint combined are roughly one-half of AT&T's size. Overnight they can absorb 15 percent of AT&T's capacity. This implies that MCI and Sprint have at least 30 percent spare capacity that could be deployed overnight.

The implication of these findings is that, if anything, competition may require more, rather than less spare capacity to be flexible enough to respond the to vicissitudes of the market. Failure to recover in current revenues the current cost of business caused by the spare capacity necessary to operate in the competitive environment would be detrimental to the shareholders of such companies, perhaps even forcing some of them out of business.

## B. Switching

Version 2.2 of the Hatfield model systematically understates the cost of local switching. By selectively using heavily discounted prices for new switches and by assuming that a local service provider would instantly install all of the switching capacity it needs at once, the Hatfield

[16] Federal Communication Commission, In the Matter of Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier, FCC 95-427, October 15, 1995, paragraph 59.

model produces results that are substantially lower than the forward-looking local switching costs that real telephone providers actually incur.

Hatfield developed a relationship between switching cost per line and the size of the switch by piecing together information from various sources. In particular, the algorithm is driven by three data points constructed as follows.[17]

- Small switch: the cost per line ($241 for 1994) was taken from the Northern Business Information report on the average cost of *new* lines for independent companies. Hatfield associated the average *installed* switch size of 2,782 lines for small LECs (LEC industry less RBOCs), calculated from statistics on lines and switches reported to the FCC for 1993.

- Medium switch: the cost per line ($104 for 1994) was taken from the Northern Business Information report on the average cost of *new* lines for RBOCs. Hatfield associated the average *installed* switch size of 11,200 for RBOCs, calculated from statistics on lines and switches reported to the FCC for 1993.

- Large switch: cost per line of $75 for a 80,000 line switch, "obtained from switch manufacturers."

Hatfield then drew straight lines between the three points to determine a relationship between switch price and switch size.

Hatfield's approach suffers from two problems. First, there is a mismatch between the data sources he employs. Note, for example, he matches a 1994 forecasted price with a 1993 average embedded switch size. In addition, while Hatfield uses independents (excluding GTE) for the small switch price, GTE is included in the calculation of the switch size. Finally, the approach assumes that the *average* installed switch is of the same size as the average *new* switch, an assumption that is not necessarily valid.

[17] The switching cost function is described in some detail in the documentation for Release 1. The prices for the three switch sizes appear to be lower in Release 2. No justification for the lower prices has been provided.

Second, and more fundamental, the Hatfield model ignores the fact that LECs buy additional lines for installed switches as well as new lines for new switches. These additional lines cost more, as the study that Hatfield used for his switch prices describes.

The add-on market continues to retain revenue potential for the suppliers, particularly as the margins on new switches remain below the margins for the add-on market. A digital line shipped and in place will generate hundreds of dollars in add-on software and hardware revenue during the life of the switch. Suppliers can afford to lose a few dollars on the initial line sale in exchange for the increased revenue in the aftermarket, when prices are less likely to be set by competitive bidding.[18]

The local switching component of the Hatfield model graphically illustrates the fallacy of its scorched view of cost studies. In order for the approach to produce realistic costs (ignoring the data problems identified earlier), a new entrant would have to serve customers with initial lines only and also have the volumes to command the discounts that existing LECs apparently command. The fact that LECs expand their switches as demand grows and the existence of a lucrative aftermarket for this expansion demonstrate that the "instant LECs" posited by the Hatfield model are inconsistent with reality.

The documentation for Release 1 describes a single number for end-office switching: investment per line. Yet, the model produces two cost estimate: ports and usage. It appears that the model assigns exactly 30 percent of end office switching costs to ports and the remaining 70 percent to usage. The resulting costs are then divided by external estimates of the number of lines and minutes served by end offices in a service territory. We are aware of no justification for the assignment of end office costs to lines and usage.

### C. Converting Investments to Annual and Monthly Costs

The various manifestations of the Hatfield model are essentially models of the *investment* component of an LEC's cost structure. These investments are converted into annual and

[18] Northern Business Information, *US Central Office Equipment Market—1994*, McGraw-Hill, p. 71.

monthly amounts by (1) annualizing the investments through the use of cost-of-capital and depreciation rates and (2) estimating out-of-pocket operating expenses through the use of historical expense to investment ratios.

### 1. The Hatfield Model Underestimates the Cost of Capital

The 10 percent return in Release 2, although higher than that used in the earlier release, is too low for two reasons. First, the FCC's approved rate of return remains at 11.25 percent. Second, the whole premise behind Hatfield's cost estimates is that they emulate the effects of competition. One of these effects is to raise the riskiness, and therefore the cost of capital, of competing firms (incumbents as well as entrants). This, in turn, increases the annual capital cost for local exchange services.

### 2. The Hatfield Model's Depreciation Rates Are Lower Than Economic Depreciation

The Hatfield model uses long depreciation rates in estimating the annual costs of network investments. While such long investment lives may have been appropriate for a regulated monopoly provider, the competitive environment fostered by the Telecommunications Act is a different world. The forces of competition itself, as well as the technological change that permeates this industry, invalidate the use of the old long depreciation lives. In fact, Professor Hausman's May 30, 1996 reply affidavit demonstrates that accounting for the increased risk and uncertainty of competition increases the annual cost related to investments by a multiple of at least 3.

Release 2 of Version 2.2 of the Hatfield model lists asset lives by type of facility, e.g., end office switches have a life of 14.3 years in the model. In order to compare these depreciation lives with external sources, we have calculated a weighted (by monthly cost) of about 17 years, which is equivalent to an annual depreciation rate of 5.9 percent. This rate is

somewhat lower than the 1994 book depreciation of 7.16 percent for RBOCs, let alone the higher true economic depreciation rate.[19]

Of course economic depreciation rates are much higher. For example, Schmalensee and Rohlfs reported that AT&T's depreciation rate is 18.5 percent.[20] Even AT&T's 1994 book depreciation rate of about 11 percent is much higher than the rates used in the Hatfield model.

### 3. The Operating Expense Estimates in the Hatfield Report Are Questionable

The Hatfield Report develops expense estimates based upon ratios of *booked* expenses to investment. This approach is problematic. Operating expense ratios based on historical investment may be a poor approximation of the forward-looking relationship. Consider, for example, an expense whose costs are unrelated to the underlying technology. As capital equipment becomes more (or less) productive, the expense to capital ratio changes, even though the absolute level of unit expenses does not.

The central office switching example discussed earlier illustrates the pitfalls of using annual factors. By employing the unrealistic assumption that an LEC can buy switching at the initial prices, the model assumes that annual cost (which we understand include the generic upgrades) would be lower as well. In fact, the very report that Hatfield relies on to develop the switch model suggests that such additional costs may increase when switch vendors discount initial prices.

The factor approach also suffers from the general problem that any decrease in an investment will cause a proportionate decrease in expenses. For example, if one LEC, for whatever reason, obtained a higher discount on its equipment, the model implies that it would enjoy lower out-of-pocket expenses, an implication that defies common sense.

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[19] Federal Communications Commission, Statistics of Communications Common Carriers, 1995/1995 Edition, Table 2.9.

[20] Richard Schmalensee and Jeffrey H. Rohlfs, "Productivity Gains Resulting From Interstate Price Caps for AT&T," National Economic Research Associates, September 1992.

## V. COMPARISONS WITH EXTERNAL SOURCES

Version 2.2 of the Hatfield model produces estimates of network element costs, based on the abstract representations of network service costs. In contrast, the LECs have information on their current forward-looking costs of doing business. Because the prices for unbundled network elements obtained from the LECs must at least recover their costs, such a comparison is extremely informative.

Pacific Bell has provided the California Public Utilities Commission with results from its Cost Proxy Model (CPM) in the context of universal service. Based upon our participation in the California unbundling and universal service proceedings, we understand that the CPM is designed to replicate the forward looking costs of Pacific's operations, because the model represents the engineering rules and cost-of-equipment Pacific actually uses.

The following table compares the respective costs of network elements from the competing models for California.

| | **Hatfield**[21] | **CPM**[22] |
|---|---|---|
| Loop (per month) | $10.34 | $14.96 |
| Port (per month) | $1.17 | $1.77 |
| Usage (per minute)[23] | $0.0022 | $0.0035 |

[21] Output from Version 2.2, Release 2.

[22] Pacific Bell and INDETEC International, The Cost Proxy Model, California Universal Service Subsidy, 1996.

[23] The CPM reports a total usage cost for flat residential service. I assume 500 minutes per month to convert to a per minute cost.

In short, the Hatfield model produces costs that are about two-thirds as high as Pacific's.[24] In light of the various shortcomings we discussed previously which would tend to understate the costs produced by the Hatfield model, the CPM's results are clearly the more plausible.

## VI. INTERNAL CONSISTENCY

### A. The Hatfield Model Is Not A Valid Cost Model

The Hatfield model is not a valid economic cost model because it fails the internal and external consistency checks required of any cost model. This is more than just a theoretical point. Failure to satisfy these checks means that the Hatfield cannot represent the minimum cost of producing outputs using the most efficient forward looking technology. In Attachment I, we show this and also show that any numbers the Hatfield model produces purporting to be TS/TELRICs are biased in an unknown direction. This makes them useless for even the minimal task of providing upper and or lower bounds for prices. Further, we will show that the underlying approach is so flawed as to render the Hatfield model impossible to fix without a complete overhaul, starting with the basic conceptual approach and ending with data requirements.

### B. Cost models and TS/TELRIC calculations

The primary purpose of a cost model is to answer the question "What is the minimum cost of producing a stream of outputs using the most efficient forward looking technology and facing a perhaps uncertain stream of input prices?" To use a cost model to calculate a TS/TELRIC for a product, one calculates the minimum cost of doing business as usual and subtracts from that the minimum cost of doing business if a product line were dropped from production. Both components of this difference should be dynamic cost functions, not costs

[24] The loop costs shown in the table are 25 percent higher than those produced by Release 1 of the Hatfield Model. In contrast, in Texas, loop costs increased by only about one percent between releases. In both states, locals switching costs hardly changed.

calculated only for the year in question, but costs calculated over the optimal planning horizon of the firm. Single period static cost functions are totally inappropriate.

### C. Valid cost models

A valid cost model shows the relationship between the minimum cost of producing a flow of services using the most efficient technology, given a set of expected input prices, starting today and flowing into the future as far as the firm's optimal planning horizon. Specifically, for input prices and output levels in each year of the planning period, it shows the minimum present discounted value of producing those levels of outputs.

As a consequence of this minimization, costs functions and cost models necessarily satisfy a set of mathematical properties which can be found in a first year graduate textbook such as 'Microeconomic Analysis' by Hal Varian. Rather than a complete listing of them, we will discuss two that the Hatfield model clearly violates. The first is linear homogeneity in prices; this means if all prices are increased proportionately, then total costs will increase by the same proportion. The second is the derivative property. An easily understood form of the derivative property is this: the percentage increase in total costs as a consequence of a one percent increase in the price of an input, i.e., labor , loops, wire, and the like, will be exactly equal to the share of total costs directly attributable to that input. So if cable of a certain grade comprises 10% of total costs and its price rises 100%, then total costs should rise 10% as a consequence.

To test the linear homogeneity assumption we increased all the input prices in the Hatfield model by 10% using their default California data as a base case. A valid cost structure should yield an increase in TS/TELRICs of 10% as well[25]. The results can be seen in Table 2, and can be seen to yield increases of roughly 13%—a number 30% higher than it should be.

[25] This result is proved in Attachment I.

**Table 2: Comparison of Hatfield TS/TELRIC Results**
**California**

| | Base Costs | Costs with Prices Increased 10% | Percent Change |
|---|---|---|---|
| **Loop Distribution** | $5.8896520 | $6.6891172 | 13.5741% |
| **Loop Concentrator/Multiplexer** | $1.9731690 | $2.2106481 | 12.0354% |
| **Loop Feeder** | $2.4756549 | $2.8369763 | 14.5950% |
| **Local Switching** | $1.1665027 | $1.3116730 | 12.4449% |
| **Other** | | | |
| **Operator Systems** | $20,717,935 | $22,754,619 | 9.8305% |
| **Common Transport** | $0.0008782 | $0.0009917 | 12.9239% |
| **Dedicated Transport** | $4.9076776 | $5.5376178 | 12.8358% |
| **Signaling Link Transport** | $18.7658876 | $21.0828863 | 12.3469% |
| **Signaling Transfer Points** | $0.0000316 | $0.0000355 | 12.3475% |
| **Service Control Points** | $0.0010527 | $0.0011827 | 12.3475% |
| **Tandem Switching** | $0.0009939 | $0.0010920 | 9.8723% |
| **Total Cost of Network Elements** | $3,342,085,225 | $3,782,821,746 | 13.1875% |

We can speculate about the source of the problem but we cannot be sure because, in addition to having no documentation, the version we were sold has locked and hidden cells which prevented us a detailed audit. In the attachment we show that to the extent the Hatfield Model maintained the multiplicative structure of its past versions one should expect the derivative property of cost functions to be violated as well. Regardless of the source or reason for the error, the fact that the model produces wrong results is incontrovertible. And to emphasize the consequences of the error we once again point out that any cost function or cost model that fails even one of the criteria required of a cost function, whether as stated above or

found in a text, cannot represent the minimum cost of producing services using the most efficient forward looking technology.

## VII. THE HATFIELD MODEL IS BASED ON INAPPROPRIATE STATIC NOTIONS

Because the Hatfield model is a static rather than a dynamic model, it mishandles growth and underestimates the true forward-looking cost of capital. It totally ignores growth and in doing so, it mischaracterizes that spare capacity which results from optimal timing of laying discrete plant, instead labeling it as inefficient over-capacity. A consequence of this is Hatfield's concentration on and insistence that fill factors are too low. In fact, at least since the mid 1970's it has been well known that in a dynamic context, the problem of optimally investing in discrete plant when there is growth has a component not found in static situations. In his 1978 paper in the *Review of Economic Studies*, David Starret shows that the cost minimizing firm in a dynamic situation trades off some spare capacity against the economies of scale in construction. The firm cost minimizes by choosing the lengths of the intervals between which it invests. During periods between investments there will always be spare capacity and it is often optimal and cost minimizing to always have spare capacity. Moreover, the mathematical structures that might be appropriate in a static situation may not be in the dynamic one. To determine whether or not they are appropriate requires the kind of empirical testing that the Hatfield model has not undergone.

Second, it underestimates real cost of capital by ignoring the effects on the cost of capital that attend (a) the increased riskiness of an industry moving rapidly into competition and (b) the increased economic depreciation rates required recover investment in current plant and equipment. Failure to recover sunk investment has severe economic consequences; for the rate and level of the recovery of capital not only tell firms which activities to direct the use of their existing equipment but also dictate whether or not there is an incentive to replace equipment, as

it becomes obsolescent, with the next generation. Indeed, by ignoring dynamics altogether, it fails to be forward looking even in concept.

## VIII. CONCLUDING REMARKS

There are many reasons not to use the Hatfield model to determine TS/TELRICs and none to support its use. Primary among these is that it has never been tested against real data as might be expected of any model of any type. Trying to use it in spite of this is a little like asking paying customers to fly on a plane the type of which has never before flown or even tested. As an added insight to the problem of using a model that it has not been verified on actual data consider the following example. Suppose that the IRS decides to simplify its analysis of all of the paper work associated with reporting and verifying tax payers' income. To make the process easier, the IRS decides to create a model that estimates how much income from employment and investment a person makes each year. The model is simply based on assumptions about how much a person should be making based on the tax payer's age and the number of years of schooling that the person has completed. To use this model, the IRS enters the person's age and number of years of schooling and lets the model derive an estimate of income which is used in place of any reported income. Despite valid criticisms of consumer groups and without taking the time to validate what the model predicts with actual income data, the IRS then uses this model to estimate a tax payer's income and taxes the person accordingly. We would hope everyone recognizes this as a ludicrous idea but this is an exact analogy of what the Hatfield model is doing to incumbent local exchange carriers.

Beyond lack of external verification and empirical validity, explicit economic and conceptual flaws were identified that make it unlikely the model could produce any useable numbers. The model is static rather than dynamic which gives rise to, among other things, fill factors that are too high. The model does not even satisfy the minimum criteria required of properly constructed cost models—that increasing all prices an common proportion must increase TS/TELRICs by exactly the same amount. In addition, are the other fundamental flaws in the Hatfield model that we identified (1) it models the cost of no realistic local service provider and certainly not the incumbent LECs who will actually sell the unbundled elements it

attempts to cost and (2) particular inputs and processes appear to systematically understate the costs of network elements. Indeed, at the same time that AT&T reported to the FCC that it would cost $1,240 per customer if AT&T provided local service to 20 percent of the market (likely the least costly part of the market), it and MCI are supporting models that produce investment costs of only $840 per line.[26]

Like any model, the Hatfield model is best interpreted in the context of why it was built and what objectives it is intended to foster. The architects and sponsors of the Hatfield model are quite clear in their purpose—they want to buy elements from the LECs, most prominently switched access, at rates far below current rates and even below the costs of the LECs require to produce these elements. While we would all like to pay lower prices, markets only permit this when those prices are commensurate with the costs of production.

The Hatfield model developers defend their costs by arguing that any difference between the costs of their model and costs reported by the LECs (either accounting costs that are required by law and by regulators or the cost produced by LEC incremental cost models) represent the costs of overinvestment. For example, the report describing the "greenfield" version of the Hatfield model that was attached to MCI's opening comments claims that about half of the LEC's current plant represents overinvestment. Apart from the facts that this label is entirely circular and Hatfield's estimate of the so-called gap is fatally flawed by the theoretical and measurement problems with the Hatfield models, it defies common sense to believe that the overinvestment of this degree could take place.[27] Regulators (both at the federal and state level) would have to have been quite derelict in their public responsibilities in order for this event to have occurred, an unlikely event given the scrutiny this industry receives. Perhaps even more telling, employees and representatives of the IXCs and other companies purchasing inputs from

[26] The FCC's April 19, 1996 Notice of Proposed Rulemaking listed the costs AT&T reported it would incur. The Hatfield investment per line is calculated from the "greenfield" version of the model.

[27] Some of the gap between book investment and forward looking investment could represent the effect of the decline in prices for facilities such as end office switches. The fact that current prices recover some of these costs is entirely consistent with the economic fact that with technological change, no firm could survive by charging prices that completely reflect the decline in new equipment prices.

the LECs would have had to have been asleep at the switch to allow their companies to pay allegedly bloated prices for inputs for years without insisting on immediate correction of the situation. Of course, the more important concern is how network elements are unbundled in a way that promotes competition. Basing prices on costs that no real-world provider could hope to meet is *anti-competitive*, because it would stifle, not promote the most effective type of competition—facilities-based. In addition, requiring incumbent LECs to sell inputs at non-compensatory rates would have the deleterious effects of forcing whatever captive customers that may remain to subsidize the below-cost input prices and/or severely handicapping firms that represent a substantial proportion of this dynamic industry.

## ATTACHMENT I:

In this Attachment we demonstrate that the Hatfield Model violates the derivative property and that it produces biased TS/TELRICs.

Let i=1,...,n index the types of cable, let $p_{ci}$ be the price per foot of the ith type of cable, let $L_{ci}$ be the miles of the ith type of cable, let $E_{si}^{o}$ be the base year expense of structure and installation for cable of type i and let $E_{ci}^{o}$ be the base year expense of cable of type i, let $E_{si}$ be the cost minimizing expenditure for expenses associated with cable of type i and let $E_{ci}$ be the cost minimizing expenditure on cable of type i, and let y be the output for which a TS/TELRIC is desired.

### A. The Hatfield Model Violates the Derivative Property

The loop cost part of the Hatfield model may be represented as

$$C = \sum_{i=1}^{n} (p_{ci} L_{ci}) \left[ 1 + \left( \frac{E_{si}^{o}}{E_{ci}^{o}} \right) \right].$$

The derivative property of cost functions requires that the derivative of a cost function with respect to an input price give the optimal amount of the input.[28] Thus, the derivative of C with respect to $p_{ci}$ should give $L_{ci}$. Symbolically this is,

$$\frac{\partial C}{\partial p_{ci}} = L_{ci}.$$

Unfortunately, direct calculation of the partial derivative of the Hatfield model yields

[28]We use the level form of the derivative property here rather than the proportional or logarithmic derivative form we used in the text, because the level form has easier mathematics.

$$\frac{\partial C}{\partial p_{ci}} = L_{ci}\left[1+\left(\frac{E^{o}_{si}}{E^{o}_{ci}}\right)\right]$$

which is an over statement of $L_{ci}$ by a factor of

$$\left[1+\left(\frac{E^{o}_{si}}{E^{o}_{ci}}\right)\right].$$

## B. Hatfield TS/TELRICs Are Biased

For simplicity, assume only expenditures on cable, and expenses. The results are exactly the same with switching and expenses except the notation is more elaborate and difficult to follow. The Hatfield Model gives a cost function of the following form:

$$C^{*} = \sum_{i=1}^{n}(p_{ci}L_{ci})\left[1+\left(\frac{E^{o}_{si}}{E^{o}_{ci}}\right)\right]$$
$$= \sum_{i=1}^{n}(E_{ci})\left[1+\left(\frac{E^{o}_{si}}{E^{o}_{ci}}\right)\right].$$

The cost minimizing cost function is

$$C = \sum_{i=1}^{n}(E_{ci}+E_{si}).$$

Use the difference calculus to obtain Hatfield TS/TELRIC and the true TS/TELRIC.

For the Hatfield Model,

$$\Delta C^{*} = \sum_{i=1}^{n}(\Delta E_{ci})\left[1+\left(\frac{E^{o}_{si}}{E^{o}_{ci}}\right)\right],$$

for the true model

$$\Delta C = \sum_{i=1}^{n} (\Delta E_{ci} + \Delta E_{si}).$$

Taking the difference between the terms gives

$$\begin{aligned}\Delta C - \Delta C^* &= \sum_{i=1}^{n} \left( \Delta E_{ci} + \Delta E_{si} - (\Delta E_{ci}) \left[ 1 + \left( \frac{E_{si}^o}{E_{ci}^o} \right) \right] \right) \\ &= \sum_{i=1}^{n} \left( \Delta E_{si} - (\Delta E_{ci}) \left( \frac{E_{si}^o}{E_{ci}^o} \right) \right) \\ &= \sum_{i=1}^{n} E_{si}^o \left( \frac{\Delta E_{si}}{E_{si}^o} - \frac{\Delta E_{ci}}{E_{ci}^o} \right).\end{aligned}$$

Dividing by $\Delta y$, multiplying and dividing by y and rearranging terms gives

$$\frac{\Delta C - \Delta C^*}{\Delta y} = \sum_{i=1}^{n} \frac{E_{si}^o}{y} \left( \frac{\Delta E_{si}}{E_{si}^o} \frac{y}{\Delta y} - \frac{\Delta E_{ci}}{E_{ci}^o} \frac{y}{\Delta y} \right)$$

which is the bias in the incremental costs. The bias is then a weighted sum of the differences between installation and structure expenditure elasticities and the cable expenditure elasticities.

## C. Valid TS/TELRICs Must Be Linear Homogeneous in Input Prices

As discussed above, total cost functions must be first degree (or linear) homogeneous in input prices. This means if all input prices are increased by the same percent, say 10%, than total costs will increase by the same percent, in this case 10%. In this section we show that TS/TELRICs must satisfy the same requirements. We state the result as a Lemma

TS/TELRICs are linear homogeneous in input prices.

Proof:

Let the total cost of providing n services at levels $y_1,...y_n$, with m inputs which have prices $w_1,...,w_m$ be denoted $C(y_1,...y_n, w_1,...,w_m)$. The TS/TELRIC for service 1 is given by

$$TS/TELRIC_1(y_1,...y_n,w_1,...,w_m) = C(y_1,...y_n,w_1,...,w_m) - C(0,y_2,...y_n,w_1,...,w_m).$$

Where $C(0, y_2,\ldots y_n, w_1,\ldots, w_m)$ is the minimum cost of dropping the production of service one entirely while keeping the levels of all other outputs at their previous values. Thus, both $C(y_1,...y_n, w_1,...,w_m)$ and $C(0,y_2,...y_n, w_1,...,w_m)$ satisfy the linear homogeneity requirements,

$$\lambda C(y_1,\cdots,y_n,w_1,\cdots,w_m) = C(y_1,\cdots,y_n,\lambda w_1,\cdots,\lambda w_m)$$
$$\lambda C(0,y_2,\cdots,y_n,w_1,\cdots,w_m) = C(0,y_2,\cdots,y_n,\lambda w_1,\cdots,\lambda w_m)$$

Thus, by subtraction

$$\lambda C(y_1,\cdots,y_n,w_1,\cdots,w_m) - \lambda C(0,y_2,\cdots,y_n,w_1,\cdots,w_m)$$
$$= C(y_1,\cdots,y_n,\lambda w_1,\cdots,\lambda w_m) - C(0,y_2,\cdots,y_n,\lambda w_1,\cdots,\lambda w_m)$$

or

$$\lambda TSLRIC(y_1,\cdots,y_n,w_1,\cdots,w_m) = TSLRIC(y_1,\cdots,y_n,\lambda w_1,\cdots,\lambda w_m).$$

Which says, in words, that proportionally increasing all input prices will increase TS/TELRICs by the same proportion.

## REFERENCES:

Hausman, Jerry A. (1996) Reply Affidavit Before the Federal Communications Commission In the Matter of Implementation of Local Competition Provisions in the Telecommunications Act of 1996 CC docket No. 96-98.

Starret, David (1978) 'Marginal Cost Pricing of Recursive Lumpy Investments', *Review of Economic Studies* pp. 215-227.

**GTE FLORIDA INCORPORATED**

**DIRECT TESTIMONY OF MEADE C. SEAMAN**

**DOCKET NO. 960847-TP**

**Background**

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

A. My name is Meade C. Seaman. My business address is 600 Hidden Ridge, Irving, Texas.

**Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR POSITION?**

A. I am employed as Director -- Local Competition/Interconnection Program Office for GTE Telephone Operations, which has telephone operations in 28 states.

**Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL AND WORK EXPERIENCE.**

A. I graduated from the University of South Florida in 1976 with a Bachelor's degree in Accounting. In 1988, I graduated from Indiana Wesleyan University with an M.B.A.

I began my career in the telecommunications industry in 1976 with General Telephone Company of Florida as a Business Relations Assistant. In 1983, I joined GTE Service Corporation in Irving, Texas, as Staff Manager--Interchanged Service

Compensation. In 1985, I was named Director--Regulatory and Industry Affairs, where I was responsible for the development and coordination of all non-rate case related proceedings. In October 1994 I became Director-Demand Analysis and Forecasting, where my responsibilities included forecasting of all line-related and usage-related services. I was recently appointed to my current position as Director--Local Competition/Interconnection Program Management Office.

**Q. WHAT ARE YOUR PRINCIPAL RESPONSIBILITIES IN YOUR CURRENT POSITION?**

A. My principal responsibilities include negotiating interconnection, unbundling, and resale agreements with requesting carriers and developing policies relating to local competition. I also am responsible for leading GTE's arbitration efforts.

**Q. HAVE YOU TESTIFIED IN OTHER PROCEEDINGS?**

A. Yes. I have testified before the commissions in Ohio, Indiana, Missouri, Pennsylvania, Wisconsin, Iowa and Illinois.

**Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

A. The purpose of my testimony is to (1) describe GTE's negotiations with AT&T, and (2) summarize GTE's Response to the fundamental issues raised in AT&T's Petition. But first, I will

briefly discuss the Telecommunications Act of 1996 and the FCC's implementing rules as they relate to GTE's pricing proposal.

## The Telecommunications Act and the FCC's Rules

**Q. PLEASE COMMENT ON THE TELECOMMUNICATIONS ACT OF 1996 (THE ACT) AND THE IMPLEMENTING RULES ADOPTED BY THE FEDERAL COMMUNICATIONS COMMISSION IN ITS FIRST REPORT AND ORDER.**

A. The Act itself is unprecedented, and makes fundamental changes to the local telecommunications industry. Specifically, the Act is intended to encourage competition by requiring incumbent local exchange carriers (ILECs) such as GTE to provide interconnection and access to unbundled network elements at cost-based rates, and to offer services for resale at wholesale rates based on an ILEC's avoided costs.

The FCC's rules, however, contradict the Act on several significant points. For example, AT&T requests interconnection, services, and unbundled elements under § 251(c) of the Act. The prices for these facilities and services are subject to the pricing standards set forth in § 252(d)(1)-(3). The Act expressly provides that the ***State commissions*** have exclusive authority to establish and apply these standards. The FCC, however, has set out detailed rules and methodologies of its own for these pricing

standards, precluding States from considering other methodologies.

What is most troubling about the FCC's Order is that it establishes "default proxy rates" for wholesale services and unbundled elements that States may adopt as interim rates pending a hearing on the merits. GTE is very concerned with this proposal. First, as discussed in our prehearing brief, we believe the FCC improperly assumed the State's rate-setting function and exceeded its statutory authority. Second, we believe the FCC's default rates are erroneous, and while AT&T may disagree with us, we believe we are entitled to a hearing on the merits as well as an opportunity to present our case ***before*** rates can be imposed upon GTE.

A related concern is that the recombining of unbundled elements contemplated by the FCC Order would allow bypass of access charges and also allow avoidance of the appropriate resale pricing standards. The FCC's Order violates the intent of the Act not to change the level and application of carrier access charges. For example, the Order arbitrarily sets end office switching prices at the proxy range of 2 to 4 mils, and it arbitrarily reduces the residual interconnection charge (RIC) to three-quarters of its former level. As a further example, it established without hearing

or cause a sunset period for application of carrier common line charges and the three-quarters of the RIC.

Along these same lines, I would like to note that in my experience, regulatory bodies have devoted more time to general rate proceedings and other, more "common" regulatory matters than to this proceeding, where the Commission must resolve fundamental issues resulting from the reorganization of an entire industry. We recognize that the time lines are imposed by federal law, not State commissions, but we need to ensure that the fundamental issues -- such as those relating to pricing and costing -- receive the attention they deserve.

**Q. AT&T REQUESTS THAT THE FCC'S PROXY RATES BE IMPOSED ON GTE ON AN INTERIM BASIS WHILE ALL THESE ISSUES ARE BEING CONSIDERED. WOULD GTE BE HARMED BY THESE RATES, EVEN IF THE COMMISSION ALLOWED FOR A RETROACTIVE "TRUE-UP" MECHANISM?**

A. Yes, GTE would be irreversibly harmed. While it is conceivable that the State could order retroactive treatment from a revenue perspective, the market cannot be retroactively corrected. If unbundled rates are set at levels below cost, new entrants will have the ability to attract more customers than they otherwise would be capable of attracting away from GTE. Once this excessive share loss occurs, it would be impossible for the State

to correct for the problem from a customer perspective. It is very costly for all firms to win back a customer once lost to another competitor. For all these reasons, and for the reasons set forth in our Arbitration Brief and Response, GTE believes that the FCC's proxy rates should not be applied.

**Q. HAS GTE PROPOSED ITS OWN PRICES FOR WHOLESALE SERVICES, UNBUNDLED ELEMENTS, AND INTERCONNECTION?**

A. Yes, it has. However, the prices for network elements are not compensatory due to GTE's distorted rates. Wholesale rates and retail rates must be consistent and rational for all the rates set. GTE's wholesale rates for unbundled elements reflect market considerations, but GTE's retail rates were set with certain public policy goals in mind, most notably the goal of universal service. These goals allowed prices for some services to be set below their economic costs, while other services were priced far above costs as a source of contribution for the below-cost services. Other examples of historical ratemaking policy include statewide rate averaging and class of service pricing. As long as GTE was the single provider, the public policy goals could be achieved without harm to the Company or its customers.

Now, however, competition has been introduced in the local exchange market. In that event, there arises a mismatch between, on the one hand, the pricing methodology historically

used for determining retail and wholesale rates (where rates will not uniformly reflect costs) and, on the other hand, the cost-based pricing required by the Act for unbundled elements and interconnection.

For this reason, GTE respectfully requests that the Commission move expeditiously to establish a uniform and consistent set of pricing policies that can be applied to the pricing of all of GTE's services -- retail, wholesale, and unbundling.

**Background on AT&T Negotiations**

**Q. WOULD YOU BRIEFLY DESCRIBE THE HISTORY OF GTE'S NEGOTIATIONS WITH AT&T?**

A. Yes. The parties spent many months negotiating hundreds of issues. The parties' efforts were reflected in comprehensive five-part matrix, which the parties used to outline their positions and describe the status of each issue. If the status column were shown as "closed," the parties reached agreement based on the position outlined in the GTE column. If the status of the item were shown as "open," the parties failed to reach agreement. Not surprisingly, the parties disagree on the fundamental issue of pricing methodology, and this core issue must be resolved here.

**Q PLEASE ELABORATE ON HOW THIS MATRIX WAS DEVELOPED.**

A. AT&T initiated the negotiations by issuing a list of nearly 500

"requirements," and GTE and AT&T jointly agreed upon a process to negotiate efficiently these demands. First, we jointly established three levels of negotiations: (1) subject matter expert (SME) teams to deal with pricing, costing and a multitude of technical and operational issues; (2) a core team, which coordinated the SME team effort and set the agenda and timing on negotiation meetings; and (3) an executive team -- of which I was a member -- to deal with policy and dispute resolution.

The matrices are divided into five areas: (1) Billing, (2) Features and Services for Local Resale, (3) Pre-ordering/Ordering for Local Resale, (4) Interconnection/Unbundling, and (5) Pay Phone-Local Resale. The parties agreed that these issues could be screened into two separate categories: (1) those issues specifically addressed by the Act; and (2) those issues we considered to be "business" issues not governed by the Act. For example, two of the business-related issues we discussed were GTE's provisioning of voice messaging and inside wire maintenance to AT&T's customers. Both of these services are "below the line" services for GTE, which means they are not regulated. Again, the parties agreed that these were business issues unrelated to the Act. Now, however, it appears that AT&T wants GTE to resell these services under the avoided cost rate referenced in the Act. We believe these issues, and all other issues of this nature, should not be addressed in this arbitration because, as the parties agreed

earlier, they are business-related issues unrelated to the Act's requirements. Of course, if we have misread AT&T's Petition and supporting documentation and AT&T is not raising these issues in this arbitration, then GTE will discuss these business issues outside of arbitration.

**Q. HOW DID THE PARTIES KEEP TRACK OF THE MANY ISSUES INVOLVED IN THEIR NEGOTIATIONS?**

A. The parties cooperated in developing the matrix I already described above to keep track of all the issues. Many of the items on which the parties had agreed were subject to only two qualifications: (1) that GTE must receive a fair price for its services and property, and (2) that GTE must recover the costs it incurs in accommodating AT&T's requests. Issues that could not be resolved at the SME level were grouped into "like" categories. These categories were then written up in greater detail to reflect each party's position and put into matrix form. This matrix is referred to as the "Core Team Matrix" and has been included in GTE's filing.

**Q. DID THE PARTIES NEGOTIATE A DRAFT CONTRACT?**

A. No. I want to emphasize that the supposedly "joint draft" contract that AT&T presented with its package of "Relevant Documents" is misleading. Contrary to AT&T's characterization of it, that draft contract does not reflect GTE's positions, or even significant

aspects of it. The process of drafting the contract never reached issues regarding unbundling network items, or many other issues. When AT&T first presented its proposed contract language to GTE on July 1, 1996, the voluminous terms largely reflected AT&T's initial demands, for the most part ignoring much of the progress in negotiations to date. The fact that the draft contract was introduced so late in the negotiations, did not reflect issues negotiated up to that point in time, and introduced hundreds of new conditions not previously discussed between the parties, meant that many sections of the contract were never negotiated. For purposes of reviewing the parties' positions, therefore, the draft contract presented by AT&T is not relevant to this proceeding.

**Q. IN LIGHT OF AT&T'S APPARENT REVERSAL OF THE POSITIONS IT TOOK DURING NEGOTIATIONS, WHAT IS GTE'S RESPONSE TO AT&T'S PROPOSED CONTRACT?**

A. GTE assumes that AT&T has not really agreed to anything, and therefore we felt compelled to rely on our original positions on almost every issue. It is unfortunate that we must do so here, but we are left with little choice.

## Summary of GTE's Response

**Q. PLEASE SUMMARIZE GTE'S RESPONSE TO AT&T'S PETITION.**

A. In this summary, I have divided the issues into four major

categories: (1) wholesale services; (2) unbundled elements; (3) interconnection; and (4) "back office" issues such as ordering, provisioning, and systems implementation, functions that take place in the "back office" and that customers are usually not aware of. Finally, I review AT&T's proposed contract term and indemnification provisions, which are not fundamental issues but which warrant a brief discussion.

**Wholesale Services**

**Q. WHAT SERVICES WILL GTE OFFER ON A WHOLESALE BASIS TO AT&T?**

A. GTE will offer all the services it currently offers on a retail basis except for those set forth in the testimony of GTE's wholesale services/avoided cost witness. The services GTE will not offer on a wholesale basis include, for example, below-cost services, promotional services, and services that are already provided on a wholesale basis (e.g., special access sold to carriers and private line services offered predominately to carriers).

**Q. WHY DOES GTE EXCLUDE THESE SERVICES?**

A. Let me first address GTE's position with respect to below-cost services. Under GTE's current rates, certain services are priced below cost. These services receive contributions from other services, such as intraLATA toll, access, and vertical and discretionary services, all of which are priced above incremental

cost. If GTE were required to offer its below-cost services on a wholesale basis, then other carriers would (1) obtain avoided-cost discounts for both below-cost and above-cost services, and (2) be able to pocket the contributions from the above-cost services that had been used to price the other services below-cost. Accordingly, GTE could not cover its total costs unless these services are excluded from GTE's wholesale offerings or are repriced to cover their costs.

Second, GTE should not be required to offer services such as promotions on a wholesale basis; otherwise GTE would not be able to differentiate its retail services from those of competing carriers. Put another way, a competitor will be able to offer any service it wants on any terms and conditions it desires to attract new customers, and GTE needs this same flexibility to respond to competition on a retail basis and give its customers more choices.

For example, if GTE offers a special promotion to its customers but is required to provide that same promotion to AT&T on an avoided cost basis, then GTE could never differentiate its offerings from those of AT&T. Importantly, GTE would have absolutely no incentive to develop additional promotions and other new services that would benefit customers because AT&T could take and use them for its own marketing and economic advantage. In fact, GTE could never differentiate its offerings

from AT&T's. This result is contrary to the purpose of the Act by limiting choices to customers. The Act should be implemented in a manner that allows all carriers to respond to competition, including GTE.

**Q. HOW SHOULD THE SERVICES GTE OFFERS ON A WHOLESALE BASIS BE PRICED?**

A. These services should be priced as follows: Retail price minus GTE's actual avoided cost, plus the wholesale costs GTE incurs, plus opportunity cost. GTE's resale/avoided cost witness describes GTE's avoided cost methodology whereby costs are excluded on a work-element basis as opposed to using broad account categories. In this way, GTE's methodology captures GTE's true avoided costs, in accordance with the Act's requirements.

**Unbundled Elements**

**Q. PLEASE DESCRIBE THE UNBUNDLED ELEMENTS GTE WILL PROVIDE TO AT&T.**

A. GTE will offer on an unbundled basis the following:

(1) the loop, which is in general the transmission facility which extends from a main distribution frame to the customer premises;

(2) the port, which in general is the line card and associated peripheral equipment on a GTE end office switch that serves as the hardware termination for the customer's exchange service on

that switch, generates dial tone and provides the customer a pathway to the public switched telecommunications network; (3) transport, by which I mean the transmission facility which extends from a main distribution frame (MDF) to either another MDF or a meet point with transport facilities of AT&T (unbundled transport is provided under rates, terms and condition of the applicable tariff); (4) signaling, which in general is SS7 signaling and transport service in support of AT&T's local exchange service; and (5) certain databases in accordance with the rates, terms and conditions of applicable switched access tariff.

This description of unbundling means that AT&T may lease and interconnect to whatever of these unbundled elements it chooses, and may combine these unbundled elements with any facilities or services that AT&T may itself provide, pursuant to the following terms: first, the interconnection shall be achieved by expanded interconnection/collocation arrangements AT&T shall maintain at the wire center at which the unbundled services are resident; and second, that each loop or port element shall be delivered to AT&T's collocation arrangement over a loop/port connector applicable to the unbundled services through other tariffed or contract options; and third, AT&T shall combine unbundled elements with its own facilities but shall not recombine GTE unbundled elements.

**Q. GTE DOES NOT PROPOSE TO UNBUNDLE ITS SWITCH. PLEASE EXPLAIN.**

A. GTE will provide the port, as I described above. "Unbundling the switch" is a term AT&T has coined to describe what it wants: a-la-carte access to each switch function and feature. There are several problems with AT&T's approach. First, such unbundling is not technically feasible at this time, and it ignores the limitations on switch capacity. Second, it ignores the tremendous cost that would be associated with trying to develop these features into a-la-carte menu selections; they currently are not configured in that manner. Third, AT&T would be able to avoid paying access charges.

**Q. AT&T WANTS TO BE ABLE TO OBTAIN UNBUNDLED ELEMENTS FROM GTE AND THEN REASSEMBLE THEM TO OFFER END-TO-END SERVICE. WHAT IS GTE'S POSITION ON THIS ISSUE?**

A. As I alluded to earlier when describing the nature of AT&T's access to the GTE unbundled elements, GTE strongly believes that AT&T should not be permitted to unbundle and then reassemble GTE's network. Such a proposal by AT&T would render meaningless the Act's required distinction between unbundled elements and wholesale services -- that they be priced under different cost methodologies.

**Q. HOW SHOULD THE PRICES FOR UNBUNDLED ELEMENTS BE SET?**

A. The prices should be cost-based, as required by the Act. They should be set in a manner to allow recovery of GTE's actual costs of its actual network and should not be based on the theoretical costs of a network that has never been built, as AT&T proposes. GTE has proposed a pricing methodology that meets the Act's requirements and that allows prices to be set by the market as competition develops. This methodology is discussed in detail in the Economic Report included in our Response.

**Interconnection**

**Q. PLEASE DESCRIBE GTE'S POSITION ON THE APPROPRIATE PRICING OF INTERCONNECTION.**

A. GTE's position on all pricing matters is that the Company should be given the opportunity to recover costs incurred in the operations of the Company from the "cost-causers." Sections 251(b)(5) and 252(d)(2) of the Act, as well as the FCC's order released August 8, 1996, set forth the standard for establishing reciprocal compensation arrangements. These standards provide for the mutual and reciprocal recovery of each carrier's costs, calculating such amounts on the basis of the additional costs of terminating calls originated by the other carrier. A bill-and-keep arrangement is inconsistent with these standards unless costs of

the two carriers are symmetrical and the volume of traffic terminated on each other's network is approximately equal.

"Back Office" Issues

**Q. PLEASE DISCUSS GTE'S POSITION ON ISSUES SUCH AS OPERATOR SUPPORT SYSTEMS, BILLING, PROVISIONING, MAINTENANCE, SYSTEMS INTERFACES, AND OTHER "BACK OFFICE" ISSUES.**

A. GTE believes that many of these issues need to be approached on an industry-wide basis, especially as they relate to GTE, which operates in 28 states. System interfaces are an important issue not just for AT&T but for all competitive carriers that want to interconnect with GTE. For example, GTE uses a standard, nationwide billing system, and it would not be appropriate for each state to establish unique interface standards that simply will not work in a single system that serves many states and many competitive carriers. For this reason, GTE believes these back office issues are best resolved in an industry-wide setting or workshops after the fundamental issues of pricing and costing are resolved on a state-specific basis. A key issue that unites all of these issues is the very important element of cost. As and when changes are to be made to satisfy AT&T's particular desires, the carrier causing the change -- in this case AT&T -- must pay for the cost of making the change.

The issues relating to specific back office functions and systems are discussed in the testimony of various GTE witnesses in this arbitration.

Term of Agreement; Indemnification

**Q: DOES GTE HAVE A POSITION ON THE TERM OF ANY AGREEMENT WITH GTE AND AT&T?**

A. Yes. GTE believes the term of the agreement should be limited to no more than two years. Given the unprecedented scope of the Act and all the issues raised, it would not be prudent to enter into a long-term contract.

AT&T has sought a term of five years, asserting that the length of that time will help them to get established in the market. In fact, a five-year period is likely to be far longer than the period of transition from monopoly regulation to competition, and would greatly prejudice GTE. AT&T does not need any such time to enter the market and to begin to effectively compete with GTE.

**Q AT&T HAS SOUGHT INDEMNITY FOR SO-CALLED UNBILLED AND UNCOLLECTED REVENUE. WOULD YOU EXPLAIN THIS ISSUE AND GTE'S POSITION?**

A. AT&T wants GTE to ensure that AT&T receives all revenues it expects to receive from traffic, regardless of whether the traffic was interrupted because of a system fault. AT&T's theory

apparently is that because GTE is the ILEC whose system AT&T wants to pick apart in order to rebuild a system for itself, then any system fault will necessarily be caused by GTE. AT&T's proposed definition of GTE's liability, i.e., GTE is liable for its "own actions in causing, or its lack of actions in preventing" AT&T's lost revenue from work errors, software alterations, or unauthorized attachments to the loop, is the equivalent of strict liability. If AT&T wants GTE to indemnify it, then AT&T should pay, not customers.

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

A. Yes.