BellSouth Telecommunications, Inc.
Suite 2101
333 Commerce Street
Nashville, Tennessee 37201-3300

615 214-6301
Fax 615 214-7406

Guy M. Hicks
General Counsel

October 22, 1999

VIA HAND DELIVERY

Mr. David Waddell, Executive Secretary
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, Tennessee 37245

Re: *Petition for Arbitration of ITC^DeltaCom Communications, Inc. with BellSouth Telecommunications, Inc. pursuant to the Telecommunications Act of 1996*
Docket No. 99-00430

Dear Mr. Waddell:

Enclosed are the original and thirteen copies of the Direct Testimony of William E. Taylor, Ph.D. This testimony has been revised in response to a request from the Staff to include additional references to the specific issues being addressed in the testimony.

A copy of the enclosed is being provided to counsel of record for all parties.

Very truly yours,

Guy M. Hicks

GMH/jem

Enclosure

FILE

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CERTIFICATE OF SERVICE

I hereby certify that on October 22, 1999, a copy of the foregoing document was served on the parties of record, via the method indicated:

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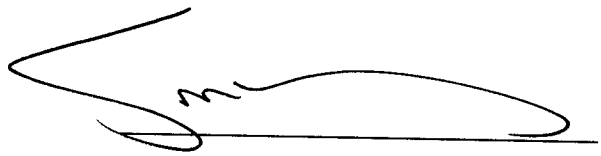
Richard Collier, Esquire
Tennessee Regulatory Authority
460 James Robertson Parkway
Nashville, TN 37243-0500

[✓] Hand
[ ] Mail
[ ] Facsimile
[ ] Overnight

H. LaDon Baltimore, Esquire
Farrar & Bates
211 Seventh Ave. N, # 320
Nashville, TN 37219-1823

[ ] Hand
[✓] Mail
[ ] Facsimile
[ ] Overnight

David I. Adelman, Esquire
Sutherland, Asbill & Brennan LLP
999 Peachtree St., NE
Atlanta, GA 30309



BEFORE THE
TENNESSEE REGULATORY AUTHORITY

IN RE:	)	
PETITION FOR ARBITRATION OF ITC^DELTACOM	)	
COMMUNICATIONS, INC. WITH BELLSOUTH	)	**DOCKET NO. 99-00430**
TELECOMMUNICATIONS, INC. PURSUANT TO	)	
THE TELECOMMUNICATIONS ACT OF 1996	)	

DIRECT TESTIMONY

OF

WILLIAM E. TAYLOR, Ph.D.

ON BEHALF OF

BELLSOUTH TELECOMMUNICATIONS, INC.

OCTOBER 15, 1999

n/e/r/a
Consulting Economists

DIRECT TESTIMONY OF WILLIAM E. TAYLOR, Ph.D.

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ON BEHALF OF BELLSOUTH TELECOMMUNICATIONS, INC.

DIRECT TESTIMONY OF WILLIAM E. TAYLOR, Ph.D.

BEFORE THE TENNESSEE REGULATORY AUTHORITY

DOCKET NO. 99-00430

OCTOBER 15, 1999

I. INTRODUCTION AND SUMMARY

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND CURRENT POSITION.

A. My name is William E. Taylor. I am Senior Vice President of National Economic Research Associates, Inc. ("NERA"), head of its Communications Practice, and head of its Cambridge office located at One Main Street, Cambridge, Massachusetts 02142.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL, PROFESSIONAL, AND BUSINESS EXPERIENCE.

A. I have been an economist for twenty-five years. I graduated from Oak Ridge High School in 1964, earned a Bachelor of Arts degree from Harvard College in 1968, a Master of Arts degree in Statistics from the University of California at Berkeley in 1970, and a Ph.D. from Berkeley in 1974, specializing in Industrial Organization and Econometrics. For the past twenty-five years, I have taught and published research in the areas of microeconomics, theoretical and applied econometrics, which is the study of statistical methods applied to economic data, and telecommunications policy at academic and research institutions. Specifically, I have taught at the Economics Departments of Cornell University, the Catholic University of Louvain in Belgium, and the Massachusetts Institute of Technology. I have also conducted research at Bell Laboratories and Bell Communications Research, Inc.

I have participated in telecommunications regulatory proceedings before many state public service commissions, including the erstwhile Tennessee Public Service Commission and the Tennessee Regulatory Authority ("Authority"). Before the Tennessee Public

Service Commission, I testified in Docket No. 91-01173 (a theoretical analysis and appraisal of the proposed Tennessee Regulatory Reform Plan) on behalf of South Central Bell Telephone Company, and in Docket No. 95-02499 (on the definition and measurement of the cost of supplying universal service and economic principles for creating a competitively-neutral universal service fund) on behalf of BellSouth Telecommunications, Inc. More recently, before the Authority, I have testified in Docket No. 97-00309 (on the probable economic benefits from BellSouth's entry into interLATA market), on behalf of BellSouth Long Distance, Inc., and in Docket Nos. 96-00067 and 96-01331(on economic costing and pricing principles for resold and unbundled services), 97-01262 (on costing principles for pricing interconnection and unbundled network elements), and 97-00888 (on economic principles for sizing the state universal service fund), on behalf of BellSouth Telecommunications, Inc.

In addition, I have filed testimony before the Federal Communications Commission ("FCC") and the Canadian Radio-television Telecommunications Commission on matters concerning incentive regulation, price cap regulation, productivity, access charges, local competition, interLATA competition, interconnection and pricing for economic efficiency. Recently, I was chosen by the Mexican Federal Telecommunications Commission and Telefonos de Mexico ("Telmex") to arbitrate the renewal of the Telmex price cap plan in Mexico.

I have also testified on market power and antitrust issues in federal court. In recent work years, I have studied—and testified on—the competitive effects of mergers among major telecommunications firms and of vertical integration and interconnection of telecommunications networks.

Finally, I have appeared as a telecommunications commentator on PBS Radio and on The News Hour with Jim Lehrer. My curriculum vita is attached as Exhibit WET-1.

Q. PLEASE DESCRIBE NERA, YOUR PLACE OF EMPLOYMENT.

A. Founded in 1961, National Economic Research Associates, Inc. ("NERA") is an internationally known economic consulting firm. It specializes in devising economic solutions to problems involving competition, regulation, finance, and public policy. Currently, NERA has more than 275 professionals (mostly highly experienced and

credentialed economists) with 10 offices in the U.S. and overseas offices in Europe (London and Madrid) and Sydney, Australia. In addition, NERA has on staff several internationally renowned academic economists as Special Consultants who provide their professional expertise and testimony when called upon.

The Communications Practice, of which I am the head, is a major part of NERA. For over 30 years, it has advised a large number of communications firms both within and outside the U.S. Those include several of the regional Bell companies and their subsidiaries, independent telephone companies, cable companies, and telephone operations abroad (e.g., Canada, Mexico, Europe, Japan and East Asia, Australia, and South America). In addition, this practice has supported a large number of legal firms and the clients they represent, and routinely provided testimony or other input to governmental entities like the Federal Communications Commission ("FCC"), the Department of Justice, the U.S. Congress, several state regulatory commissions, foreign regulatory commissions, and courts of law. Other clients include industry forums like the Unites States Telephone Association.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been asked by BellSouth Telecommunications, Inc. ("BellSouth")—an incumbent local exchange carrier ("ILEC")—to provide an economist's perspective on various issues awaiting resolution in this proceeding for the arbitration of an interconnection agreement between BellSouth and ITC^DeltaCom Communications, Inc. ("ITC^DeltaCom")—a competitive local exchange carrier ("CLEC"). The salient issues I address in my testimony include: (1) reciprocal compensation for traffic sent to Internet service providers ("ISPs") and (2) non-recurring charges ("NRCs") for BellSouth's operations support systems ("OSS").

Q. PLEASE SUMMARIZE YOUR POSITIONS ON THOSE ISSUES.

A. My positions on the issues are summarized as follows:

Issue 3(1): Should BellSouth be required to pay reciprocal compensation to ITC^DeltaCom for all calls that are properly routed over local trunks, including calls to Information Service Providers ("ISPs")?

I. Inter-Carrier Compensation for ISP-Bound Calls

1. The FCC has ruled that ISP-bound calls are jurisdictionally interstate, not local. Therefore, the proper model of interconnection that applies to ISP-bound calls is not that between an originating ILEC and a terminating CLEC, but that between an originating ILEC and an inter-exchange carrier ("IXC").

2. Regardless of whether ISP-bound calls are jurisdictionally local or interstate, the correct economic perspective on inter-carrier compensation rests on the principle of cost causation. On the basis of that principle alone, reciprocal compensation should not be paid by the originating ILEC for ISP-bound calls. Instead, the ISP should compensate that carrier (and any other carrier that switches the ISP-bound call) for the end-to-end cost caused by the ISP customer, and recover that cost directly from the ISP customer.

3. The ISP is not an end-user (of a serving CLEC) but rather a carrier. Therefore, like the IXC that pays carrier access charges to partially defray the cost of a long distance call, the ISP should pay analogous usage-based charges to defray costs incurred by other carriers on its behalf to switch an ISP-bound call.

4. Persisting with reciprocal compensation (from the ISP customer's originating ILEC to the CLEC that ultimately switches the call to the ISP) would generate an inefficient subsidy for Internet use, distort the local exchange market, and generate unintended arbitrage opportunities for CLECs. These would be opportunities for CLECs to specialize in serving ISPs with the sole aim of accumulating reciprocal compensation revenues.

5. Based on the FCC ruling that ISP-bound calls are primarily interstate, three states (Massachusetts, New Jersey, and South Carolina) have recently declared that the payment of reciprocal compensation by ILECs originating ISP-bound calls be stopped. Massachusetts regulators, in particular, have noted that by encouraging arbitrage opportunities, the reciprocal compensation regime of inter-carrier compensation for ISP-bound calls subverts real local exchange competition.

Issue 2; 2(a)(iv); 2(b)(I) and 6(a) combined as follows:

(a) What is the definition of parity?

(b) Pursuant to this definition, should BellSouth be required to provide the following and if so, under what conditions and at what rates:

(1) Operational Support Systems ("OSS")

(2) UNEs

(3) Access to Numbering resources

(4) An unbundled loop using Integrated Digital Loop Carrier ("IDLC") technology; and

Priority guidelines for repair and maintenance and UNE provisioning?

II. Charges for Operations Support Systems

1. CLECs seeking access to the ILEC's OSS must use electronic interfaces and related systems created specifically for that purpose. The economic principle of cost causation requires that (1) OSS-requesting carriers pay for the costs they cause and (2) the prices charged for that purpose reflect the forward-looking costs to provide access to OSS.

2. Access to OSS generates both recurring and non-recurring costs. The non-recurring costs themselves arise from development (of interfaces and the like) and use (associated with every service order). Development costs vary primarily with the amount of capital (degree of automation) built into the interfaces, while use costs vary primarily with the extent of labor required. There is generally a trade-off between these two types of cost: the higher one is, the lower the other will be.

3. OSS-requesting carriers must be required to pay for both development and use costs. If development costs are not recovered from those carriers, there would be a strong incentive for those carriers to demand interfaces and related systems excessively, in terms of both quantity and quality.

4. The Authority has already permitted (in Docket No. 97-01262) the full recovery of both types of cost, and BellSouth has filed appropriate rates accordingly.

II. INTER-CARRIER COMPENSATION FOR ISP-BOUND CALLS

Issue 3(1): Should BellSouth be required to pay reciprocal compensation to ITC^DeltaCom for all calls that are properly routed over local trunks, including calls to Information Service Providers ("ISPs")?

Q. SHOULD RECIPROCAL COMPENSATION BE PAID FOR ISP-BOUND CALLS?

A. No, for two reasons. First, as the FCC has already correctly determined, calls made to Internet destinations are much more likely to be jurisdictionally interstate than local.[1]

[1] FCC, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996* and *Inter-Carrier Compensation for ISP-Bound Traffic*, CC Docket Nos. 96-98 and 99-68, Declaratory

(continued...)

Second, and more importantly, the economic principle of cost causation implies that the relationship between the end-user and the ISP is analogous to that between the end-user and an inter-exchange carrier ("IXC"). In fact, regardless of the exact jurisdictional status of Internet calls, there are sound *economic* reasons to (1) reject reciprocal compensation for such calls and (2) require that the ISP pay usage-based charges to the ILEC and/or CLEC akin to the access charges currently paid by IXCs to the ILEC for all long distance calls carried.

Q. PLEASE EXPLAIN THE FCC'S FINDING THAT ISP-BOUND CALLS ARE JURISDICTIONALLY MORE LIKELY TO BE INTERSTATE.

A. The FCC recently stated that it:

> traditionally has determined the jurisdictional nature of communications by the *end points* of the communication and consistently has rejected attempts to divide communications at any intermediate points of switching or exchanges between carriers.[2]

Based on this premise, the FCC explained that calls made to the Internet:

> do not terminate at the ISP's local server ... but continue to the ultimate destination or destinations, specifically at an Internet website that is often located in another state. The fact that the facilities and apparatus used to deliver traffic to the ISP's local servers may be located within a single state does not affect [the FCC's] jurisdiction. ... Indeed, in the vast majority of cases, the facilities that incumbent LECs use to provide interstate access are located entirely within one state.[3]

The FCC's reasoning is absolutely correct. A call is said to be terminated when it is *delivered to the called party's premises*.[4] In this sense, an ISP-bound call may transit the switch of the carrier serving the ISP, but the call is then delivered to the Internet web site

(...continued)

Ruling in CC Docket No. 96-98 and Notice of Proposed Rulemaking in CC Docket No. 99-68 ("Internet Traffic Order"), released February 26, 1999.

[2] Internet Traffic Order, ¶10. Emphasis added.

[3] *Id.*, ¶12. Footnotes omitted.

[4] FCC, *In the Matter of Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-
(continued...)

which, as the FCC noted, may be located outside the state in which the call originated. The FCC made it perfectly plain that what matters for determining jurisdiction is the end-to-end transmission itself, not how many different carriers or facilities handle the Internet call on its way.

The FCC also noted that while jurisdiction is determined unambiguously when a call originates and terminates entirely within the circuit-switched network, it is a very different matter when the call crosses over from the circuit-switched network into the packet-switched network (that comprises the Internet's backbone network and Internet web sites) along the way to its destination.[5] This is particularly important because the packet-switched network is a "connectionless" network in which termination, in the sense understood within the circuit-switched network, technically does not happen. For example, before it is over, the same Internet call may reach several destination points on the Internet. Also, calls are switched or, more accurately, "routed" over the packet-switched network in a dynamic manner. This means that the Internet call, rearranged in the form of data packets of given length, are sent in a scrambled manner along different available paths within the backbone network, and the "call" is then reconstituted when all of the packets reach the intended Internet destination. This method of transport and routing is nothing like the termination that occurs within the circuit-switched network where, for every call originated and terminated, a dedicated call path is established for the duration of the call. These crucial differences make it all the more likely that an Internet call will cross several state boundaries—and in a random manner—before it reaches its destination. At best, such a call would be "jurisdictionally mixed," as the FCC has already correctly determined.

Q. PLEASE EXPLAIN THE PRINCIPLE OF COST CAUSATION AND ITS RELEVANCE TO COST RECOVERY?

(...continued)

98, First Report and Order ("Local Competition Order"), released August 19, 1996, ¶1040.

[5] Internet Traffic Order, ¶18.

A. Cost causation is the fundamental economic principle on which all pricing and cost recovery efforts should be based. This principle asks two questions: (1) who or what has caused the cost in question (cost source)? and (2) how much is the cost in question (level of cost recovery)? Once the person or activity that gives rise to a cost has been identified, the amount of cost in question is recovered entirely from that source. This linkage between cost recovery and the cost source stands on its own, and makes no reference whatsoever to the distribution of benefits. That is, even if an activity provides benefits to others besides the cost-causer, cost should be recovered fully from its source and not from incidental beneficiaries. For example, if my decision to travel to Nashville causes me to employ resources (airline, rental car, lodging, etc.) that cost $2,000 between them, then that entire cost should be recoverable from me, the cost-causer. Whether someone or something else benefits in any material or other way from my travel to Nashville is irrelevant for determining what the cost of that travel is or who should pay the price to recover that cost.[6] In general, the prices that consumers pay should reflect the costs caused by their consumption of specific goods or services.

It is well known that consumers decide what to buy and how much to buy on the basis of prices they pay. Their act of buying also causes cost. To ensure that society's scarce resources are put to their best use, and that only the goods and services of highest value to society are produced and consumed, consumers (cost-causers) must be made to pay prices that fully reflect the costs they cause. Application of the cost causation principle thus leads to prices that fully recover costs and, at the same time, ensure that consumption occurs—and resources are used—efficiently.

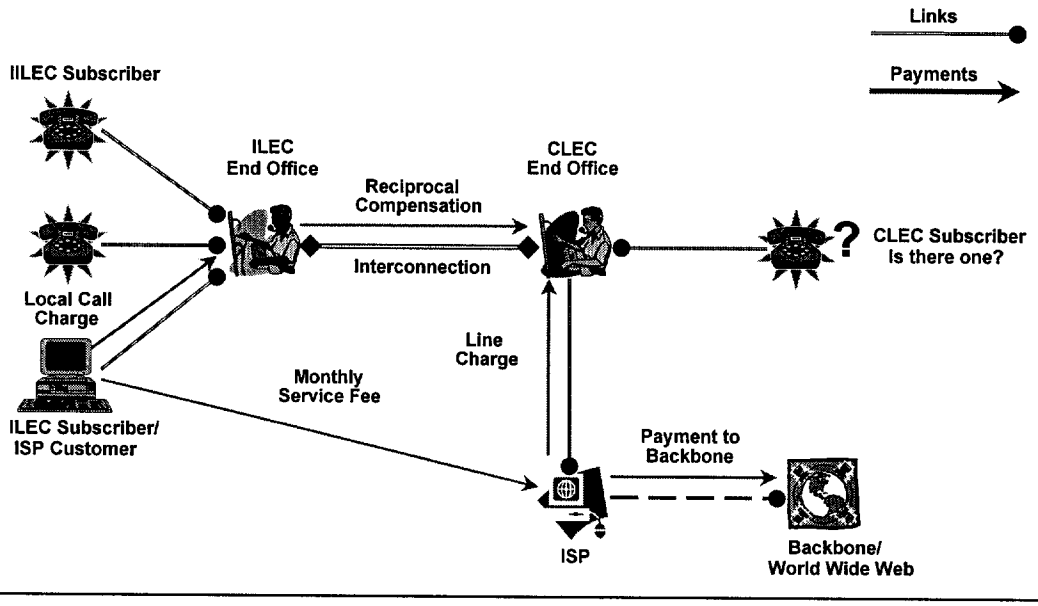
[6] The airline or the hotel may "benefit" from my using them in the course of my travel to—and within—Nashville. So would every hot dog stand, souvenir shop, or amusement park that I visit while I am there. However, none of these would be sources of the cost of my travel and should, therefore, not be required to share in the recovery of the cost caused by my travel. I alone should be held responsible for all costs linked to my travel.

Q. PLEASE EXPLAIN HOW COST CAUSATION DETERMINES THAT ISPs ARE ANALOGOUS TO IXCs AND SHOULD THUS PAY CHARGES SIMILAR TO ACCESS CHARGES.

A. To understand this point, it is first necessary to recapitulate the *erroneous* view of the 0network that underlies ITC^DeltaCom's belief that an Internet call is jurisdictionally

Figure 1. Charges and Inter-Carrier Compensation (The ITC^DeltaCom View):

Originating ILEC Pays Reciprocal Compensation to Terminating CLEC



local. This view of the network, depicted by Figure 1, rests on two crucial assumptions:

1. The ILEC subscriber that calls the Internet is acting as a customer of the originating ILEC,[7] even when the call goes through the ISP to which it pays monthly access fees.[8]

[7] I distinguish here between a "subscriber" and a "customer" in order to show cost causation. I subscribe to my local carrier in order to have *access* to the public switched network, but I act as a customer of that local carrier in order to *use* Call Waiting service or of a long distance carrier in order to *use* interstate long distance service. When I am a customer of the local carrier, I cause usage-based cost for that carrier. Similarly, I cause cost for the long distance carrier when I use *its* long distance service.

[8] An implicit assumption here is that the ISP has a point of presence in the local calling area of the Internet caller.

2. The ISP itself is an end-user (not a carrier) of the CLEC and the Internet call terminates at the ISP.

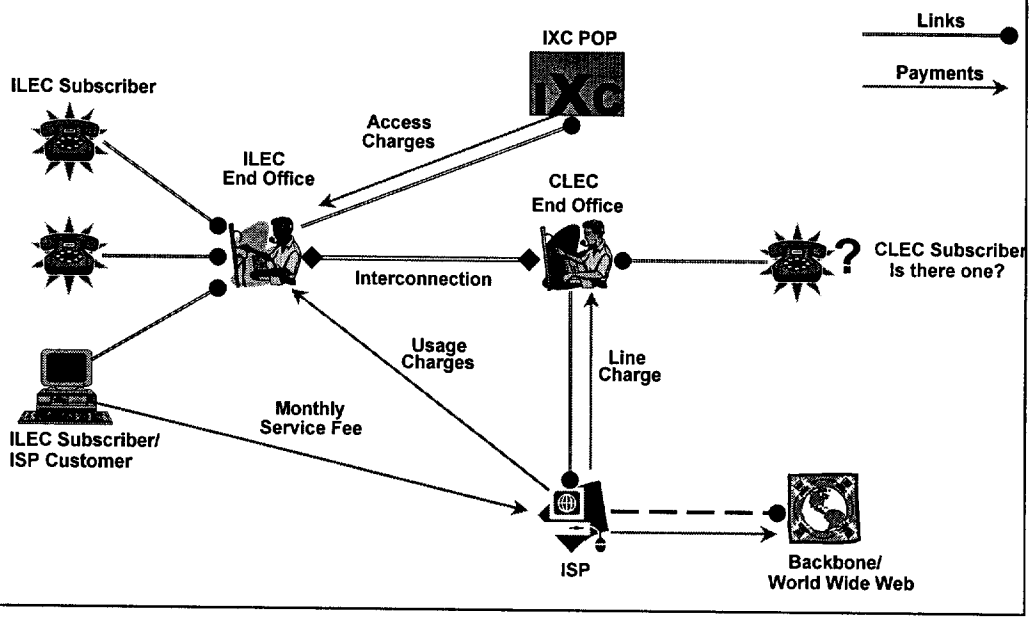
Under these assumptions, the ILEC subscriber that makes the Internet call is an end-user of the originating ILEC (paying local residential rates for line charges) and the ISP is an end-user of the terminating CLEC (paying local business rates for line charges). The monthly Internet access charges paid by the ILEC subscriber to the ISP and the leased high-speed line charges paid by the ISP to Internet backbone networks are only incidental to this model and have no further role in determining jurisdiction. In this view of the network, therefore, the portion of the Internet call that lies entirely within the circuit-switched network, i.e., up to the ISP, *resembles* a local call under an interconnection arrangement between two local carriers. From this it would appear that the CLEC that terminates the ISP-bound call is entitled to reciprocal compensation under the FCC's rules.

This conclusion is fundamentally incorrect because it ignores cost causation, specifically, that the ILEC subscriber that makes the Internet call does so *while acting as a customer of the ISP* to which it pays monthly fees for Internet access and which, in return, markets directly to the customer and provides a point of presence in the customer's local calling area in order to provide easy access. Thus, the same subscriber that acts in the capacity of a customer of the originating ILEC when making a local voice call can act in the capacity of a customer of the ISP when making an Internet call. This situation is not an unfamiliar one; in fact, it is exactly analogous to the subscriber acting in the capacity of a customer of an IXC when making a long distance call. This analogy—and the proper cost

causation view of Internet calling—is explained in Figure 2.

Figure 2. Charges and Inter-Carrier Compensation (The BellSouth View):

ISP Pays Compensation to Originating and Terminating LECs



This view of the network, depicted by Figure 2, rests on two different assumptions:

1. The ILEC subscriber that calls the Internet is acting as a customer of the ISP to which it pays monthly access fees, even though the call is facilitated by the originating ILEC and the CLEC serving the ISP.

2. The ISP is viewed as a *carrier*—akin to an enhanced service provider ("ESP")—that routes the Internet call through the backbone network to its final destination. The ISP performs standard carrier functions such as transport and routing, as well as maintains leased facilities within the backbone network. It is, therefore, *not* an end-user of the CLEC.

These assumptions appropriately depict the Internet-bound (or, ISP-bound) call as being much closer in character to an interstate long distance call than to a local call that is contained entirely within the local calling area. They also dispel the notion that an Internet-bound call is really two calls: the first call ending at the CLEC serving the ISP,

and the second call routed by the ISP through the backbone network to its Internet destination.

Validity for this set of assumptions comes from the principle of cost causation. This principle suggests that, *for the purposes of an Internet call*, the subscriber is properly viewed as a customer of the ISP, not of the originating ILEC (or even of the CLEC serving the ISP). The ILEC and the CLEC simply provide access-like functions to help the Internet call on its way, just as they might provide originating or terminating carrier access to help an IXC carry an interstate long distance call. Therefore, with the proper network model being analogous to ILEC-IXC interconnection (access), rather than to ILEC-CLEC interconnection, the proper form of inter-carrier compensation should be usage-based charges analogous to carrier access charges for long distance calls, rather than reciprocal compensation.

Q. PLEASE EXPLAIN THE CONTRAST BETWEEN THESE TWO "MODELS" OF INTERCONNECTION IN MORE DETAIL.

A. ***ILEC-CLEC Interconnection Model.*** When a BellSouth subscriber places a local call that terminates to a CLEC subscriber, what functions does BellSouth perform? Obviously, it originates the call by providing dialtone, local switching, and transport to the CLEC's point of interconnection. In addition, BellSouth has marketed the service to its subscriber (and customer of local calls), determining the price and price structure and other terms and conditions under which the customer decides to place the call. BellSouth will determine if the call has been completed, bill the customer for the call (if measured service applies) or for flat-rate service, answer questions regarding the bill or the service and collect money from the customer or lose the revenue if it is unable to collect from the customer. The story is precisely symmetric if the originating party is a CLEC customer and BellSouth or another CLEC terminates the call.

Thus, under ILEC-CLEC interconnection (see Figure 1), the originating subscriber is the cost-causing party and is the customer of the originating ILEC. That originating ILEC charges its cost-causing customer for the entire end-to-end call and compensates the CLEC

that terminates the call. The originating ILEC's network costs plus the compensation it pays is—in theory—recovered from the local call charge it levies on its (originating) customer. The terminating CLEC's costs are recovered from the compensation payment it receives from the originating ILEC. In this arrangement, both parties recover their costs, and the cost-causer is (again, in principle) billed for the entire cost he or she causes both carriers to incur. Thus, this arrangement is not an arbitrary regulatory or legal construction: for local interconnection between an ILEC and a CLEC, it makes economic sense. It could arise spontaneously in unregulated competitive markets where the ILEC serving the originating subscriber acts effectively as its agent in making necessary network and financial arrangements with a CLEC to terminate the call, just as General Motors may purchase goods or services from Ford or Bendix to include in an automobile purchased by a General Motors customer.

ILEC-IXC Interconnection Model. In contrast, when a BellSouth subscriber places a long distance call using, e.g., AT&T, BellSouth's function is limited to recognizing the carrier code (or implementing presubscription in its switch) and switching and transporting the call to AT&T's point of presence. While at some level, the functions its network performs are similar to those used to deliver local traffic to a CLEC[9], the economic functions are very different. It is AT&T that has marketed the service to its customer and determined the price, price structure, and other terms and conditions of the call. AT&T will send, explain, and collect the bill from the customer or lose the revenue if it cannot. Thus, under ILEC-IXC interconnection, the originating subscriber is, from an economic perspective, the customer of the IXC, not the originating ILEC.

When an ILEC (or CLEC) subscriber places long distance calls, he acts as a cost-causing customer of the IXC. Figure 2 shows that the ILEC subscriber, acting as an IXC customer, causes costs at various points in the networks involved: for the ILECs/CLECs

[9] BellSouth supplies the customer's loop and provides dialtone, local switching, and transport to AT&T's point of presence.

that originate and terminate the long distance call, as well as for the IXC that transports it between local exchanges. The IXC receives revenue from the customer which it uses, in turn, to pay originating and terminating access charges to the ILECs/CLECs involved and to cover its own network and administration costs. In effect, the IXC acts as its customer's agent in assembling the necessary local exchange components of the call. The ILECs/CLECs involved recover their costs from access charges. If more than one such carrier is involved in delivering the call from the end user to the IXC, they typically divide the access charges paid by the IXC in proportion to the costs incurred to provision the access portion of the call. Thus, in principle, the cost-causing customer faces a price that reflects all of the costs the call engenders, and all parties that incur costs to provision the call have a claim on the cost-causer's payment.

Thus, from an economic perspective, ILEC-IXC interconnection and ILEC-CLEC interconnection have some important similarities as well as some important differences. In both cases, the originating ILEC subscriber is the cost-causer, and that subscriber pays the supplier (the party with whom the subscriber has contracted for service) for the end-to-end service he receives. The major difference is that in the ILEC-CLEC local interconnection regime, the cost-causing ILEC subscriber is also a customer of the originating ILEC for local service, while in the ILEC-IXC regime, that cost-causing subscriber acts as a customer of the IXC for long distance service.

Q. WHY DOES ILEC-CLEC-ISP INTERCONNECTION RESEMBLE THAT BETWEEN THE ILEC AND THE IXC BUT NOT THAT BETWEEN THE ILEC AND THE CLEC?

A. The question at issue is: when multiple ILECs/CLECs combine to deliver traffic to an ISP, are they interconnecting in an ILEC-CLEC local interconnection regime or an ILEC-IXC interstate access regime? The FCC has characterized the link from an end-user to an ISP as an *interstate* access service and, absent other considerations, ISPs would be subject to charges analogous to interstate access charges. As far back as 1983, the FCC concluded that ESPs (which, today, would include ISPs) are "among a variety of users of access

service" in that they "obtain local exchange services or facilities which are used, in part or in whole, for the purpose of completing interstate calls."[10]

The service provided by an ISP exists to enable that ISP's customers to access information and information-related services stored on special computers or web servers at various locations around the world. The ISP typically facilitates such access by selling a flat-rated monthly or yearly Internet access service that, in most cases, calls for that ISP customer to make only a local call in order to reach the ISP's modems. Besides price, ISPs compete on the extent of geographic coverage, specifically, the number of local calling areas they can offer to ISP customers as possible points of connection ("POCs"), as well as on various components of service quality including provision of specialized information services.[11] The ISP markets directly to the originating ILEC's subscriber, attempting to maximize its number of customers and the amount of traffic *incoming* to it by publishing and advertising as many local calling numbers (at its POCs) as possible, and doing everything within its power to help the potential customer avoid having to incur per-minute or toll charges to have Internet access. If necessary, ISPs may use foreign exchange ("FX") lines to haul Internet traffic from considerable distances while still offering service to the ISP customer for the price of a local call.[12] Some ISPs offer 800 service for their customers to access their network when flat-rate local calling is unavailable, although there

I.

[10] FCC, *In Re: MTS and WATS Market Structure*, CC Docket No. 78-72, Memorandum Opinion and Order ("MTS/WATS Order"), 1983.

[11] The POCs are points at which the carrier serving the ISP (which may be a CLEC) terminates the ISP-directed call and routes it to the ISP.

[12] In that respect, the implicit contract is analogous to that which exists between a party with a toll-free "800" telephone number and other parties that are invited to call that number. The holder of the 800 number causes cost by signaling others to call him or her and accepts that cost by being willing to pay for it. Moreover, the holder of the 800 number may control the number of potential callers by choosing the method for disclosing the number (e.g., directory information, word of mouth, special invitation, etc.). Similarly, ISPs that use FX lines to provide local connectivity to distant customers signal a willingness to accept—and pay for—the generally higher cost of providing Internet access to those customers. They too can control the number of potential ISP customers by choosing both how many points of connection to offer for providing local connectivity and pricing options for its Internet access service.

are some which impose a per-minute charge on the subscriber for such access. Some ISPs maintain Internet gateways for their customers and earn revenue from advertisers that depend more or less directly on the number of customers and the number of times its customers access advertised sites. The ISP bills its customers for their access and usage, and it is the ISP that loses money if it cannot collect from them. From an economic perspective, then, the party that causes the cost associated with ISP-bound traffic is the originating ILEC's subscriber who acts in the capacity of an ISP customer. In this sense, ISP-bound traffic has the same characteristics as IXC-bound traffic in the ILEC-IXC regime and has characteristics opposite to CLEC-bound traffic in the ILEC-CLEC local interconnection regime.

Q. ARE THERE DIFFERENCES BETWEEN AN IXC-BOUND CALL AND AN ISP-BOUND CALL?

A. A theoretical difference is that an ILEC subscriber that places a long distance call does not incur a local usage charge on the originating end, while an ISP customer, in principle, does. As a practical matter, however, this difference is irrelevant. Flat and measured basic local exchange rates have *not* been set to reflect the added cost of serving ISP-bound traffic, and a longstanding public policy concern with the level of basic exchange rates limits the ability of the regulator to recover these costs from all local exchange customers.[13] In addition, ISPs compete, in part, by providing local exchange numbers so that their customers can reach them without incurring per-minute charges from the serving ILEC or CLEC. Because ISP-bound traffic is caused by the ISP's customer, the ISP would generally bear the cost of the local connection, just as the IXC does for long distance traffic. And, in fact, competitive forces in the ISP market have encouraged ISPs to incur

[13] Indeed, if the longer holding times of ISP-bound traffic impose costs different from those for ordinary voice traffic, raising prices for all local exchange customers to recover costs imposed by the ISP's customers would constitute a subsidy to ISP access. ILECs that originate ISP-bound traffic would effectively charge ISP customers less than incremental cost and ordinary voice customers more than otherwise for local exchange usage.

costs and lease facilities so that their customers do not pay additional local exchange costs. For both of these reasons, it would be naïve to think that the originating ILEC's subscriber fully compensates that ILEC for the end-to-end cost of the ISP-bound call.[14]

All of these are reasons why instead of the ILEC paying reciprocal compensation (or, a terminating charge) to CLECs as in the ILEC-CLEC local interconnection regime, for Internet calls by the ILEC subscriber, ISPs should pay the ILEC (and the CLEC that also serves it) usage charges analogous to carrier access charges paid by IXCs. Only such a payment will close the gap between the full cost of the call up to the ISP and the local call charge that is assessed to the end-user by the originating ILEC. In this economically correct view of inter-carrier compensation, the CLEC that switches Internet calls for the ISP is compensated not from reciprocal compensation paid by the originating ILEC but from usage-based charges paid to it by the ISP. Moreover, this economically correct perspective does *not* depend on the exact jurisdictional status of the ISP-directed call.

Q. DO ISPs PAY USAGE-BASED CHARGES (ANALOGOUS TO CARRIER ACCESS CHARGES) TODAY?

A. No. Even though the FCC has recently declared that ISP-bound traffic is, at best, jurisdictionally mixed and is, in most instances, interstate, no rulemaking has yet occurred to establish such charges for ISPs. Thus, it remains uncertain as to exactly when rules to this effect will be established. Also, ISPs are currently beneficiaries of an exemption from paying interstate carrier access charges that has been granted to ESPs since 1983.[15] I understand, however, that the exemption itself only applies to payment of access charges to

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[14] This problem is likely to be even more acute when the ILEC's subscriber pays flat-rated local charges rather than per-call rates for local service.

[15] The FCC has traditionally explained that exemption thus:

> to protect certain users of access services, such as ESPs, that had been paying the generally much lower business service rates from the rate shock that would result from immediate imposition of carrier access charges.

Internet Traffic Order, ¶5, and MTS/WATS Order, ¶715.

ILECs. Thus, CLECs could, if they so chose, still assess access-like charges on ISPs that use their network.

Q. IN THE ABSENCE OF FCC ACTION TO ESTABLISH INTER-CARRIER COMPENSATION RULES, HOW HAVE THE INDIVIDUAL STATES ACTED?

A. For a period of time until the FCC's Internet Traffic Order was issued in early 1999, a number of states pursued their own rulemaking on the issue. Those states chose to adopt the ILEC-CLEC local interconnection view of the world and required that the originating ILEC pay reciprocal compensation to terminating CLECs for ISP-bound calls just as they would for local voice calls. After the FCC's Internet Traffic Order was issued, regulators in Massachusetts, who had previously also adopted the local interconnection view, reversed themselves and declared the unqualified payment of reciprocal compensation for ISP-bound traffic to be antithetical to real competition in telecommunications.[16] Subsequently, regulators in New Jersey, in reversing an arbitrator's recommendation in October 1998, also ordered that reciprocal compensation not be paid for ISP-bound traffic.[17] More recently, in ruling on a BellSouth-ITC^DeltaCom interconnection arbitration, regulators in South Carolina directed that reciprocal compensation *not* be paid for ISP-bound traffic sent by BellSouth to ITC^DeltaCom.[18]

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[16] Massachusetts Department of Telecommunications and Energy ("DTE"), *Complaint of MCI WorldCom, Inc., Against New England Telephone and Telegraph Company d/b/a Bell Atlantic-Massachusetts for Breach of Interconnection Terms Entered Into Under Sections 251 and 252 of the Telecommunications Act of 1996*, Docket No. 97-116-C, Order ("Massachusetts ISP Compensation Order"), May 1999. The DTE ordered that all future reciprocal compensation payments by Bell Atlantic be placed in an escrow fund until final disposition on the matter of inter-carrier compensation. The CLECs serving ISPs in Massachusetts currently do not themselves receive any compensation for ISP-bound traffic.

[17] New Jersey Board of Public Utilities, *In the Matter of the Petition of Global Naps, Inc. for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements with Bell Atlantic-New Jersey Pursuant to Section 252(b) of the Telecommunications Act of 1996*, Docket No. T098070426, Order, July 7, 1999.

[18] Public Service Commission of South Carolina, *Petition of ITC^DeltaCom Communications, Inc.,for Arbitration with BellSouth Telecommunications, Inc. Pursuant to the Telecommunications Act of 1996*, Docket No. 1999-259-C, Order No. 1999-690, Order on Arbitration, October 4, 1999.

Q. WHAT REASONS DID MASSACHUSETTS REGULATORS GIVE FOR THIS REVERSAL?

A. The Massachusetts Department of Telecommunications and Energy explained its reasons for the reversal thus:

> The unqualified payment of reciprocal compensation for ISP-bound traffic, implicit in our October Order's construing of the 1996 Act, does not promote real competition in telecommunications. Rather, it enriches competitive local exchange carriers, Internet service providers, and Internet users at the expense of telephone customers or shareholders. This is done under the guise of what purports to be competition, but is really just an unintended arbitrage opportunity derived from regulations that were designed to promote real competition. A loophole, in a word. ... But regulatory policy ... ought not to create such loopholes or, once having recognized their effects, ought not leave them open.
>
> Real competition is more than just shifting dollars from one person's pocket to another's. And it is even more than the mere act of some customers' choosing between contending carriers. Real competition is not an outcome in itself—it is a means to an end. The "end" in this case is *economic efficiency* ... Failure by an economic regulatory agency to insist on true competition and economic efficiency in the use of society's resources is tantamount to countenancing and, to some degree, encouraging waste of those resources. Clearly, continuing to *require* payment of reciprocal compensation ... is not an opportunity to promote the general welfare. It is an opportunity only to promote the welfare of certain CLECs, ISPs, and their customers, at the expense of Bell Atlantic's telephone customers and shareholders.[19]

Q. WHY WOULD THE ILEC-CLEC LOCAL INTERCONNECTION REGIME WITH PAYMENT OF RECIPROCAL COMPENSATION FOR ISP-BOUND TRAFFIC HARM ECONOMIC EFFICIENCY AND FAIL TO PROMOTE TRUE COMPETITION?

A. The harm to economic efficiency in an ILEC-CLEC local interconnection regime with payment of reciprocal compensation for ISP-bound traffic occurs for three reasons:

1. Inefficient subsidization of Internet users by non-users.

[19] *Id.* Emphasis added (in part) and in original (in part).

2. Distortion of the local exchange market.

3. Creation of perverse incentives to arbitrage the system at the expense of basic exchange ratepayers.

Q. PLEASE EXPLAIN HOW THE ILEC-CLEC INTERCONNECTION REGIME FOR ISP-BOUND TRAFFIC COULD CAUSE INEFFICIENT SUBSIDIZATION OF INTERNET USERS BY NON-USERS.

A. The principle of cost causation requires that the *ISP customer* pay at least the cost its call imposes on the circuit-switched network.[20] Suppose inter-carrier compensation for ISP-bound traffic is treated as in the ILEC-CLEC interconnection regime (Figure 1). This regime assumes at the outset that the customer initiating the call has paid the originating ILEC for the end-to-end carriage of the call, typically, the per-call equivalent of the local call charge. Out of what it receives, the ILEC would then pay reciprocal compensation to the CLEC that terminates to the ISP. This compensation is a per-minute call termination charge which, ideally, should reflect the incremental cost that the ILEC *avoids* by not having to terminate the call itself. In this scenario, problems can emerge from two sources.

First, if the local call charge is itself inefficient, e.g., it is below the incremental cost of carrying an end-to-end local voice call, then it cannot be sufficient to allow recovery of both the ILEC's incremental cost to originate the call and the CLEC's incremental cost to terminate the call. In other words, once reciprocal compensation has been paid, the ILEC would fail to recover its cost of carrying the ISP-bound call when the local call charge itself is inefficient. If the ILEC breaks even for *all* of its services in these circumstances, that would mean that Internet use (for which the cost exceeds revenue) is being subsidized by non-Internet and, most likely, non-local exchange services. This scenario is likely to play out whenever, in order to promote universal service, the local residential call charge in a state is set below the incremental cost of that call.

[20] It is assumed that the cost imposed by that customer for the packet-switched network portion of the Internet call is recovered through monthly access charges by the ISP serving that customer.

Second, if the cost to terminate an ISP-bound call is *less* than the cost to terminate the average voice call (on which most reciprocal compensation arrangements are based), then the CLEC would recover in excess of its cost. Even if the local per-call charge were compensatory, the ILEC could still end up with a higher cost liability than necessary (the sum of its own originating cost and the CLEC's inflated termination charge) and a net revenue deficit from carrying the ISP-bound call. Again, the Internet user would not be paying the cost he imposes on the originating ILEC (equivalent to receiving a subsidy).

This form of subsidization of Internet use within the circuit-switched network can inefficiently stimulate demand for Internet services and further aggravate the ILEC's tenuous position under the ILEC-CLEC interconnection regime. Additional negative consequences could be (1) greater congestion at local switches engineered for voice traffic generally and, as a result, poorer quality of voice traffic, and (2) opportunistic specialization by CLECs in the termination only of ISP-bound traffic. I discuss the resulting distortion of the local exchange market below.

Q. WHAT IS THE DILEMMA THAT THE ORIGINATING ILEC WOULD THEN FACE WITH RESPECT TO ITS OWN CUSTOMERS?

A. The originating ILEC's dilemma would then be to find a solution to the subsidization problem that is both economically correct and politically feasible. The subsidy to Internet use can be eliminated by charging differently for such use than for voice calls. Specifically, this would mean that Internet use is charged a higher rate than other local calls. While this solution would, in principle, appear economically feasible, it would require that ILECs be able to distinguish calls headed for Internet destinations from those headed for non-Internet destinations within the local calling area, and to charge for *each call* accordingly. Assuming that ILECs are able to make that distinction, such a solution would, nevertheless, mark a significant departure from the current practice of charging all customers within the same calling area the same averaged residential local rate on a flat-rated basis (i.e., not per call). A movement in this direction is far from certain at this time.

Q. HOW WOULD THE ILEC-IXC INTERCONNECTION REGIME WITH THE

PAYMENT OF ACCESS-LIKE USAGE-BASED CHARGES SOLVE THIS PROBLEM?

A. In the ILEC-IXC regime (Figure 2), the ISP customer that initiates the call causes all of the costs that are incurred, and, except for the explicit subsidy to ISP access represented by the exemption from charges analogous to interstate access charges, remains responsible for paying costs of originating, transporting, and switching its traffic to the ISP. Because of the access charge exemption, ILECs and CLECs that jointly supply access services to ISPs are not compensated for those services but, in the ILEC-IXC regime, the ILECs and CLECs that jointly provision ISP-bound calls each contribute to the ISP access subsidy no more than their proportion of costs. This arrangement is competitively neutral because all ILECs and CLECs involved contribute to the subsidy rather than just the ILECs that originate ISP-bound traffic. In this regime, an ISP has no particular incentive to become a CLEC itself, nor is the competition among ILECs and CLECs to serve ISPs distorted by incentives to seek compensation for terminating calls.

Q. PLEASE EXPLAIN HOW THE ILEC-CLEC INTERCONNECTION REGIME FOR ISP-BOUND TRAFFIC COULD CAUSE THE LOCAL EXCHANGE MARKET TO BE DISTORTED.

A. Under the ILEC-CLEC interconnection regime, the compensation paid to CLECs evidently exceeds the cost they incur in terminating the traffic and also exceeds whatever costs BellSouth might save when CLECs terminate the traffic. That the prices do not reflect costs should not be surprising. In Tennessee, interconnection prices are based on BellSouth's forward-looking TELRIC costs of terminating traffic averaged over a wide range of end-users.[21] In fact, the cost of terminating traffic to particular end-users varies a great deal, depending upon their location and the characteristics of the traffic. When traffic

[21] Average holding times are significantly longer for ISP-bound traffic: roughly 20 minutes compared with 3 minutes for ordinary voice traffic. Thus, the cost of call setup on a per minute basis is roughly only one-seventh of the per minute cost of call setup for ordinary voice traffic.

is balanced[22] between the ILEC and the CLEC, the accuracy of the TELRIC study is less material; an ILEC that overpays to terminate traffic on the CLEC's network is compensated when the CLEC overpays to terminate traffic on the ILEC's network. Thus, when traffic is balanced, no individual ILEC or CLEC is helped or handicapped in competing for retail customers in the local exchange market by the requirement that interconnection prices be based on TELRICs averaged over all customers.

However, when traffic between the ILEC and the CLEC is grossly unbalanced, e.g., when the CLEC originates little or no traffic, the accuracy of the TELRIC study for the traffic served by that CLEC is critical. If the cost to BellSouth to deliver ISP-bound traffic to the ISP is the same as to a specialized CLEC collocated with the ISP, then paying reciprocal compensation at an averaged rate would cause BellSouth's total cost of local service to increase. This cost increase would not be offset by a similar increase in revenue from terminating the CLEC's traffic (because the CLEC does not originate any traffic). Thus, local exchange competition would be distorted by the inapplicability of the averaged TELRIC to ISP traffic; CLECs that primarily serve ISPs (and originate little or no traffic) would receive revenues in excess of cost while ILECs (or even other CLECs) that serve all types of customers would experience an increase in costs without a commensurate increase in revenues.

Q. DOES THAT MEAN THAT RECIPROCAL COMPENSATION IS ILL-ADVISED BECAUSE TRAFFIC BETWEEN THE ORIGINATING ILEC AND THE CLEC THAT TERMINATES ISP TRAFFIC IS UNBALANCED?

A. Yes, but the problem here is not simply that traffic is unbalanced. First of all, ISP-bound traffic is *not* local and, therefore, not eligible for reciprocal compensation, a form of inter-carrier compensation reserved for local interconnection only. However, even on the matter of traffic balance, it is worth noting that reciprocal compensation was never envisioned as

[22] Traffic is said to be "balanced" when originating and terminating volumes are similar.

appropriate inter-carrier compensation when all traffic is essentially one-way. This would be particularly true when the true cost to terminate for the carrier that only *receives* traffic is actually lower than the termination cost (experienced by the carrier that *sends* traffic) on which a symmetrical compensation arrangement is based. But, even with balanced traffic, requiring reciprocal compensation payments for ISP-bound calls would violate the economic principle of recovering cost in accordance with cost causation.

Q. PLEASE EXPLAIN HOW THE ILEC-CLEC INTERCONNECTION REGIME FOR ISP-BOUND TRAFFIC COULD CREATE PERVERSE INCENTIVES TO ARBITRAGE THE SYSTEM AT THE EXPENSE OF BASIC EXCHANGE RATEPAYERS.

A. Arbitrage is frequently a response to a market distortion. As the DTE in Massachusetts clearly recognized, unintended arbitrage opportunities can easily emerge when competition in the local exchange market is distorted by basing inter-carrier compensation for ISP-bound traffic on the ILEC-CLEC local interconnection regime. When the compensation available to the CLEC for terminating ISP-bound traffic exceeds its actual cost of terminating that traffic, the CLEC will have a strong incentive to terminate as much ISP traffic as possible. The desire to maximize profits can bring forth some very inventive schemes that take advantage of this discrepancy but which distort market outcomes and reduce the efficiency of the telecommunications network. For example, the CLEC's profits would increase whenever a BellSouth subscriber—or its computer—could be induced to call the ISP and remain on the line 24 hours a day.[23] Sensing this pure arbitrage profit opportunity, CLECs would also have a strong incentive—indeed, have as their *raison d'être*—to specialize only in terminating ISP-bound traffic, to the exclusion of offering any

[23] Dedicated (private line) connections that bypass the public switched network are most efficient for customers desiring "always-on" or 24 hour connectivity. Despite this fact, such connectivity is sometimes offered in a manner that involves traffic origination through an ILEC's switch and termination through an ISP-serving CLEC's switch. This arrangement is clearly less interested in efficiency or the best use of valuable network resources than it is in generating the maximum possible revenue from reciprocal compensation.

other type of local exchange service. These "ISP-specializing" CLECs can—and do—easily form a three-way axis with the sole purpose of generating revenues from reciprocal compensation: the CLECs themselves, ISPs that have their traffic terminated by those ISPs but may also receive a share of the reciprocal compensation revenues—the spoils of this arrangement—to ensure their loyalty and cooperation, and ISP customers on the originating ILEC's network that generate the ISP-bound traffic. Also, the ISPs themselves are better off if their customers obtain their non-Internet local telephone service not from the CLECs that terminate ISP-only traffic but from the ILEC or other CLECs that do not serve ISPs. This is likely to create a further distortion in the local exchange market, contrary to the vision of competition embodied in the Telecommunications Act of 1996 ("1996 Act").

This issue can be put in perspective as follows. Assume, for purposes of illustration, that (1) the ILEC serves 95 percent of end-users and the CLEC serves the other 5 percent and (2) end-users are generally similar in their use of (calls to) the Internet. If the ISP then contracts with the ILEC—rather than the CLEC—for delivery of Internet calls, then 95 percent of such calls would originate *and* terminate within the ILEC's network and, as a result, generate no reciprocal compensation payments. However, if that ISP were to contract with the CLEC for the delivery of Internet traffic, the same 95 percent of Internet calls originating within the ILEC's network would traverse the CLEC's switch(es) on its way to the ISP. This arrangement would, therefore, generate reciprocal compensation payments on 95 percent of Internet calls handled by the two networks. Clearly, a strong incentive would then exist for both the CLEC and the ISP to opt for the latter arrangement.

It is not surprising, therefore, that the DTE in Massachusetts felt compelled to opine:

> We note also that *termination* of the obligation for reciprocal compensation payments for ISP-bound traffic (because that traffic is no longer deemed local) removes the incentive for CLECs to use their regulatory status "solely (or predominately)" to funnel traffic to ISPs.[24]

[24] Massachusetts ISP Compensation Order.

Q. HAVE REGULATORS TAKEN EXPLICIT NOTE OF THE FACT THAT THESE ARBITRAGE OPPORTUNITIES ARISE BECAUSE PRICES (OR, COMPENSATION RATES) ARE OUT OF LINE WITH TERMINATION COSTS?

A. Yes. Where the cost of terminating traffic to a particular type of customer differs greatly from the average, the FCC has recognized the possibility of arbitrage and has declined to use the ILEC's TELRIC termination costs as a proxy for those of the CLEC:

> Using incumbent LEC's costs for termination of traffic as a proxy for paging providers' costs, when the LECs' costs are likely higher than paging providers' costs, might create uneconomic incentives for paging providers to generate traffic simply in order to receive termination compensation.[25]

Instead, the FCC has required separate cost studies to justify a cost-based termination rate which the FCC explicitly expects would be lower than the wireline ILECs' TELRIC-based rate. Note that the paging case also involves one-way calling; like ISPs, paging companies do not originate traffic.

More recently, the FCC has acknowledged that:

> efficient rates for inter-carrier compensation for ISP-bound traffic are not likely to be based entirely on minute-of-use pricing structures. In particular, pure minute-of-use pricing structures are not likely to reflect accurately how costs are incurred for delivering ISP-bound traffic.[26]

This is clear recognition of the fact that TELRIC-based rates are fundamentally unsound for inter-carrier compensation for ISP-bound traffic. Echoing this sentiment, the Massachusetts DTE has stated flatly that

> The revenues generated by reciprocal compensation for ... incoming traffic are most likely in excess of the cost of sending such traffic to ISPs. ... Not surprisingly, ISPs view themselves as beneficiaries of this "competition" and argue fervently in favor of maintaining reciprocal compensation for ISP-bound traffic. However, the benefits gained, through this regulatory distortion, by CLECs, ISPs, and their customers do not make society as a whole better off,

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[25] Local Competition Order, ¶1093.

[26] Internet Traffic Order, ¶29.

because they come artificially at the expense of others.[27]

Q. WHAT DO YOU CONCLUDE IN LIGHT OF THESE ACKNOWLEDGEMENTS?

A. In light of these acknowledgements, it is reasonable to expect that a fairer system of inter-carrier compensation may yet be more widely adopted for all forms of one-way traffic. The ILEC-IXC interconnection regime offers one such alternative. More importantly, under that alternative:

1. perverse incentives and unintended arbitrage opportunities are removed,
2. cost causation guides cost recovery (including the payment of access-like usage-based charges by ISPs to ILECs and CLECs that handle their traffic),
3. more efficient use is made of network resources,
4. inefficient entry for the sake of earning opportunistic arbitrage profits is prevented, and
5. true competition (undistorted by the gain from specializing in terminating one-way traffic) can be realized in the local exchange market.

III. CHARGES FOR OPERATIONS SUPPORT SYSTEMS

Issue 2; 2(a)(iv); 2(b)(I) and 6(a) combined as follows:

(c) What is the definition of parity?

(d) Pursuant to this definition, should BellSouth be required to provide the following and if so, under what conditions and at what rates:

(5) Operational Support Systems ("OSS")

(6) UNEs

(7) Access to Numbering resources

(8) An unbundled loop using Integrated Digital Loop Carrier ("IDLC") technology; and

(9) Priority guidelines for repair and maintenance and UNE

[27] Massachusetts ISP Compensation Order. Emphasis added.

provisioning?

Q. WHAT ARE OSS?

A. OSS include electronic interfaces, databases, and other systems required for various functions, e.g., pre-ordering, ordering, provisioning, maintenance and repair, billing, etc. An ILEC like BellSouth routinely uses its OSS to serve its customers. In its implementation of various competition-related provisions of the 1996 Act, the FCC found that OSS functions are "essential to the ability of competitors to provide services in a fully competitive local service market."[28] The FCC further concluded that "[OSS] and the information they contain fall squarely within the definition of 'network element' and must be unbundled upon request under Section 251(c)(3) [of the 1996 Act]...."[29]

Q. WHAT ARE THE *NON-RECURRING* COSTS ASSOCIATED WITH OSS?

A. There are two economically distinct types of non-recurring OSS-related costs: (1) one-time costs to modify existing and/or build new interfaces that give CLECs access to BellSouth's OSS databases and systems, and (2) non-recurring transactional costs associated with the provisioning of services, i.e., costs to use the necessary interfaces to process a service order.[30] The first type of OSS-related cost may be characterized as an "OSS development cost," and the second type as an "OSS use cost." There is general agreement that the standard for costing in both instances should be forward-looking economic costs.

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[28] Local Competition Order, ¶522.

[29] *Id.*, ¶516.

[30] Even though I use the shorthand "OSS," it should be noted that my reference throughout is to OSS *interfaces* that BellSouth builds specifically for use by CLECs. Also, to be precise, while the type of cost in question may arise repeatedly as the interfaces are used to process different service orders, that cost remains fixed, hence, non-recurring *for each individual order*. There are also true recurring costs that are ongoing maintenance costs associated with each service order processed through the interfaces. My testimony does not address these recurring costs although BellSouth is entitled to recover them fully as well.

Q. WHAT IS THE ESSENTIAL DIFFERENCE BETWEEN OSS DEVELOPMENT AND OSS USE COSTS?

A. The difference between the two types of cost is analogous to the difference between fixed and variable costs. OSS development cost is similar to fixed cost: it arises at the point a new OSS is installed or an existing OSS is modified, but the level of that cost does not vary with the number of unbundled network elements ("UNEs") ordered or actual use of the OSS. The OSS may never actually be used by a CLEC, but the OSS development cost would have been incurred anyway. OSS use cost, on the other hand, is more akin to variable cost, namely, a cost that only arises in connection with use of a resource. Thus, OSS use cost varies with the level of use (with a minimum of zero when no use occurs). Despite this essential difference, like fixed and variable costs generally, both OSS development and OSS use costs should be measured on a forward-looking basis.

Q. IS THERE A RELATIONSHIP BETWEEN OSS DEVELOPMENT AND OSS USE COSTS, OR ARE THEY TOTALLY INDEPENDENT?

A. Even though, as explained above, the two costs are different in nature, they may still be related through an important economic trade-off. The level of technology embodied in an OSS interface system is not fixed in the long run. For example, systems may be more or less mechanized or automated, and rely on computer or artificial intelligence, expert systems, etc. to varying degrees. The less automated or complex systems require less human involvement or operation, while highly sophisticated and fully automated systems may require little or no human involvement. In this respect, capital and labor are substitutes, and more capital-intensive systems tend to be generally more expensive.

OSS development cost usually depends more upon the amount and type of capital built into the OSS. Thus, OSS embodying greater amounts of capital (or degree of automation) tend to have higher OSS *development* costs, while OSS that rely on less capital tend to have lower such costs. Since human labor is usually an important use-related or variable cost, the level of OSS use costs varies directly with how much of that resource is used. Thus, OSS that employ more capital but less labor tend to have lower

OSS *use* costs, and those that employ less capital and more labor tend to have higher such costs. This inverse relationship between OSS development and OSS use costs is thus a product of the type of OSS installed.

Q. WHAT DECIDES THE OPTIMAL LEVEL OF OSS DEVELOPMENT AND OSS USE COSTS?

A. In a market economy, the actual technology platform that is adopted derives from the choices that suppliers and users of OSS make. No single individual or firm may ultimately be responsible for the system that emerges. Suppliers may have varied preferences about the types of systems they wish to install, how much intelligence they wish to invest in their systems, how quickly they wish to recover the economic cost of their systems, how much of their own labor or other resources they wish to dedicate to the operation of their systems, etc. Users may consider ease of use, availability of their own resources, customer willingness to pay, etc., and different users may value these characteristics differently. It is therefore difficult to determine the overall level of quality of OSS that would emerge in an unregulated, competitive market. Systems for buying and selling stocks or withdrawing money from banks are highly automated and accurate; systems for purchasing airline tickets are labor intensive and relatively more prone to error. In any case, whatever type of OSS emerges, it is certainly the case that—for a given level of quality—the technology platform should minimize the present value of the *combined* OSS development and OSS use costs associated with it. This minimization would take into account the economic trade-off between OSS development and OSS use costs discussed above.

Q. IS BELLSOUTH ENTITLED TO RECOVER ITS OSS-RELATED COSTS?

A. Yes. In light of the FCC's conclusion that OSS are network elements to which requesting carriers (e.g., CLECs) must be granted non-discriminatory access,[31] cost recovery for OSS

[31] Local Competition Order, ¶523 and ¶525.

should occur in the same manner as designated for other UNEs. Specifically, Section 252(d)(1)of the 1996 Act provides for recovery of the costs of UNEs and describes the methodology for doing so. This provision allows the UNE provider (such as BellSouth) to charge just and reasonable rates that are (1) based on forward-looking cost, (2) nondiscriminatory, and (3) inclusive of a reasonable profit.

Q. HAS EITHER THE 1996 ACT OR THE FCC LIMITED RECOVERY TO SOME, BUT NOT ALL, OSS-RELATED COSTS?

A. No. The 1996 Act makes no specific mention of OSS. In its implementing rules, the FCC has declared that OSS be treated just like any UNE. The FCC has never specifically limited recovery to some, but not all, OSS-related costs. From this I conclude that the FCC has intended all along that the provider of OSS should be able to recover *all* costs related to the development and use of OSS. As explained above, these costs include both one-time and ongoing costs.

Q. HAS THE AUTHORITY RULED ON WHETHER BELLSOUTH IS ENTITLED TO RECOVER ITS OSS DEVELOPMENT COSTS?

A. Yes. In Docket No. 97-01252, the Authority ruled that BellSouth may recover its one-time OSS interface development costs incurred on behalf of OSS-requesting carriers.[32] Specifically, the Authority decided that instead of recovering all non-recurring OSS-related costs in a single, one-time NRC, BellSouth should capitalize the one-time costs and recover them in a distributed manner over time.

Q. WHAT ECONOMIC PRINCIPLE GOVERNS THE MANNER IN WHICH THE COST OF ANY SERVICE SHOULD BE RECOVERED?

A. As I stated earlier, the economic principle that determines how the cost of a service should

[32] See the Direct Testimony of Alphonso J. Varner in this proceeding for an explanation and a cited passage from the Authority's Order in Docket No. 97-01262 approving such cost recovery.

be recovered is cost causation. Requiring that entrants into a regulated market pay for the costs caused by their entry ensures that only efficient entry takes place. After the 1996 Act was passed, the FCC issued a *Notice of Proposed Rulemaking* in which it described its purpose as being:

> not to ensure that entry shall take place irrespective of costs, but to remove ... barriers ... that inefficiently retard entry, and to allow entry to take place where it can occur efficiently.[33]

Economists approve of this intention because it recognizes that entry into markets previously served by single suppliers, and subsequent competition in those markets, are not ends in themselves.[34] Rather, social policy should favor entry and competition where such entry ensures that customers are made better off. Where social policy mistakenly attempts to ensure the entry and survival of suppliers that are *less* efficient than incumbents, consumers typically end up paying for those protections in the form of higher prices or poorer service.

Q. HOW DO THESE PRINCIPLES APPLY TO OSS-RELATED COSTS?

A. Cost causation determines the source of a cost and assesses charges on that source for effecting full cost recovery. If BellSouth develops OSS for its own use, then it alone should properly be responsible for recovering all OSS-related costs. However, if BellSouth has to develop OSS for use by *other* carriers, then those other carriers should be responsible for recovery of the additional OSS-related costs caused directly by them.

Any failure to charge those other users of BellSouth's OSS for the additional OSS costs they cause—especially costs to develop OSS—would only generate perverse incentives and encourage inefficient behavior by the users. Specifically, carriers requesting access to BellSouth's OSS would then have an incentive to do so excessively, in

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[33] *Notice of Proposed Rulemaking* (NPRM) in CC Docket 98-96, ¶12.

[34] Adam Smith reminded us that with sufficient money and will, Scotland could enter the wine market and compete with France but that Scottish consumers—and surely Scottish oenophiles—would not necessarily be made better off by the experience.

terms of both quantity and quality. This incentive could be strong because higher up-front OSS development costs incurred to construct more sophisticated systems can actually lower transactional or OSS use costs. If entrants are not charged for OSS development costs, it would clearly be in their self-interest to insist upon the construction of the most sophisticated OSS-related interfaces and systems imaginable, e.g., those with complex error-processing systems that make human intervention unnecessary. The cost of the ongoing use of OSS in such an environment would be lower than with less sophisticated systems, but the *total* economic cost of the OSS interface or capability could conceivably be higher, leaving society worse off. It does not pay to automate every transaction, and it may not be cost-effective to minimize human intervention. Rather, public policy must recognize the trade-off between OSS development costs and OSS use costs when determining what OSS-using entrants must be responsible for paying. If the cost causation principle is not reflected equally in the prices paid to recover *both* of these types of costs, entrants will demand excessively capital-intensive systems, and costs to telecommunications users will be higher than necessary.

Q. AS A GENERAL MATTER, WOULD ACCESS TO OSS PROVIDED BY BELLSOUTH TO CLECs LIKE ITC^DELTACOM BE LESS EXPENSIVE IF BELLSOUTH WERE TO DEPLOY NEW TECHNOLOGY REGARDLESS OF ITS EXISTING NETWORK OR WERE TO BUILD THOSE OSS FROM SCRATCH?

A. Not necessarily. The fact that BellSouth plans to serve CLEC demand with access to its existing OSS implies that the costs associated with such access are the costs that should be used to set prices. Moreover, the sum of one-time and transactional costs for a new OSS built from scratch would far exceed that of adding customized interfaces to the existing OSS. Of course, whatever method is used to supply OSS functions in the future, consistency requires that we calculate both OSS development and OSS use costs *using the same method.*

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

Exhibit WET-1

WILLIAM E. TAYLOR

BUSINESS ADDRESS

National Economic Research Associates, Inc.
One Main Street
Cambridge, Massachusetts 02142

(617) 621-2615
(617) 621-0336 (fax)
william.taylor@nera.com

Dr. Taylor received a B.A. magna cum laude in Economics from Harvard College, an M.A. in Statistics and a Ph.D. in Economics from the University of California at Berkeley. He has taught economics, statistics, and econometrics at Cornell and the Massachusetts Institute of Technology and was a post doctoral Research Fellow at the Center for Operations Research and Econometrics at the University of Louvain, Belgium.

At NERA, Dr. Taylor is a Senior Vice President, heads the Cambridge office and is Director of the Telecommunications Practice. He has worked primarily in the field of telecommunications economics on problems of state and federal regulatory reform, competition policy, terms and conditions for competitive parity in local competition, quantitative analysis of state and federal price cap and incentive regulation proposals, and antitrust problems in telecommunications markets. He has testified on telecommunications economics before numerous state regulatory authorities, the Federal Communications Commission, the Canadian Radio-Television and Telecommunications Commission, federal and state congressional committees and courts. Recently, he was chosen by the Mexican Federal Telecommunications Commission and Telmex to arbitrate the renewal of the Telmex price cap plan in Mexico. Other recent work includes studies of the competitive effects of major mergers among telecommunications firms and analyses of vertical integration and interconnection of telecommunications networks. He has appeared as a telecommunications commentator on PBS Radio and on The News Hour with Jim Lehrer.

He has published extensively in the areas of telecommunications policy related to access and in theoretical and applied econometrics. His articles have appeared in numerous telecommunications industry publications as well as *Econometrica*, the *American Economic Review*, the International *Economic Review*, the *Journal of Econometrics*, *Econometric Reviews*, the *Antitrust Law Journal*, *The Review of Industrial Organization*, and *The Encyclopedia of Statistical Sciences*. He has served as a referee for these journals (and others)

and the National Science Foundation and has served as an Associate Editor of the *Journal of Econometrics*.

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY
Ph.D., Economics, 1974

UNIVERSITY OF CALIFORNIA, BERKELEY
M.A., Statistics, 1970

HARVARD COLLEGE
B.A., Economics, 1968
(Magna Cum Laude)

EMPLOYMENT

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC. (NERA)
1988- Senior Vice President, Office Head, Telecommunications Practice Director. Dr. Taylor has directed many studies applying economic and statistical reasoning to regulatory, antitrust and competitive issues in telecommunications markets. In the area of environmental regulation, he has studied statistical problems associated with measuring the level and rate of change of emissions.

BELL COMMUNICATIONS RESEARCH, INC. (Bellcore)
1983-1988 Division Manager, Economic Analysis, formerly Central Services Organization, formerly American Telephone and Telegraph Company. While at Bellcore, Dr. Taylor performed theoretical and quantitative research focusing on problems raised by the implementation of access charges. His work included design and implementation of demand response forecasting for interstate access demand, quantification of potential bypass liability, design of optimal nonlinear price schedules for access charges and theoretical and quantitative analysis of price cap regulation of access charges.

BELL TELEPHONE LABORATORIES
1975-1983 Member, Technical Staff, Economics Research Center. Performed basic research on theoretical and applied econometrics, focusing on small sample theory, panel data and simultaneous equations systems.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Fall 1977 Visiting Associate Professor, Department of Economics. Taught graduate courses in econometrics.

CENTER FOR OPERATIONS RESEARCH AND ECONOMETRICS

Université Catholique de Louvain, Belgium.
1974-1975 Research Associate. Performed post-doctoral research on finite sample econometric theory and on cost function estimation.

CORNELL UNIVERSITY
1972-1975 Assistant Professor, Department of Economics. (On leave 1974-1975.) Taught graduate and undergraduate courses on econometrics, microeconomic theory and principles.

MISCELLANEOUS

1985-1995 Associate Editor, *Journal of Econometrics*, North-Holland Publishing Company.
1990- Board of Directors, National Economic Research Associates, Inc.
1995- Board of Trustees, Treasurer, Episcopal Divinity School, Cambridge, Massachusetts.

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Maryland Public Service Commission (Case No. 8584, Phase II), December 15, 1994. Additional direct testimony May 5, 1995. Rebuttal testimony filed June 30, 1995.
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Florida Public Service Commission (Docket No. 980000-SP), September 24, 1998.
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October, 1999

AFFIDAVIT

STATE OF: Georgia
COUNTY OF: Fulton

BEFORE ME, the undersigned authority, duly commissioned and qualified in and for the State and County aforesaid, personally came and appeared William E. Taylor, Ph.D.-Senior Vice President-National Economic Research Associates, Inc., who, being by me first duly sworn deposed and said that:

He is appearing as a witness before the Tennessee Regulatory Authority in Docket No. 99-00430 on behalf of BellSouth Telecommunications, Inc., and if present before the Authority and duly sworn, his testimony would be set forth in the annexed testimony consisting of 31 pages and 1 exhibit(s).

William E. Taylor

Sworn to and subscribed
before me this 15th
day of October, 1999

NOTARY PUBLIC

MICHEALE F. HOLCOMB
Notary Public, Douglas County, Georgia
My Commission Expires November 3, 2001