

# **EXHIBIT B**

**BellSouth Comments  
CC Docket No. 99-273**

# Competition and Regulation for Directory Assistance Services

Prepared by

William E. Taylor,  
Harold Ware

National Economic Research Associates, Inc.

Prepared for

BellSouth Corporation,  
Qwest Communications International Inc.,  
SBC Communications Inc.,  
Verizon Telephone Companies

April 1, 2002

## Table of Contents

I. BACKGROUND, PURPOSE AND SUMMARY OF CONCLUSIONS.....	1
II. THE ECONOMICALLY CORRECT FRAMEWORK FOR ASSESSING THE ISSUES RAISED IN THE NPRM IS TO EXAMINE THE INCREMENTAL COSTS AND BENEFITS GIVEN THE CURRENT STATUS OF COMPETITION.....	4
A. The Commission should compare the incremental benefits with the incremental (direct and indirect) costs.....	4
B. The Commission should take a forward-looking approach to evaluating competition that recognizes the historical role of regulation. ....	4
1. Identifying economic substitutes and competitors. ....	5
2. Assessing barriers to entry .....	7
3. High market share does not denote market power in historically regulated markets. ....	8
C. Assessing who should pay for implementing DA policy changes, if the Commission were to adopt them.....	10
III. DA SERVICES ARE ALREADY COMPETITIVE IN THE US. ....	10
A. Overview of retail and wholesale DA services and substitutes. ....	11
B. The market includes numerous DA providers in every region. ....	13
1. Many wireline telephonic DA providers compete in every state. ....	13
2. Wireless DA is capturing a growing share of DA calls. ....	17
3. The relationship between wholesale enhanced DA providers and wireless providers is likely to enhance retail wireline competition.....	18
a. Printed telephone directories are used extensively and constrain DA providers' ability to raise prices above competitive levels. ....	19
b. Internet services are available to increasing numbers of customers and offer extensive search and information options. ....	21
c. CD-ROMs also offer detailed information capabilities.....	25
4. Independent Wholesale DA Providers Have Grown Significantly in Number and Market Presence. ....	26
5. The growth of competition has been associated with steep declines in ILEC DA volumes. ....	28
a. Major ILEC DA volumes have been declining .....	28
b. The decline in traditional LEC DA Manifests Losses Due to Competition. ....	30
6. The market is nationwide. ....	34
C. There are no substantive barriers to entry. ....	35
1. The database is not a barrier to entry.....	36
2. LEC "control of 411" does not constitute a barrier to entry.....	37
3. Ease of entry is confirmed by the growth and expansion of wholesale DA providers, the national scope of the market, and analysis of entry conditions.....	39
D. The relationship between competition for DA services and other telecommunications services does not support adopting Telegate's proposal.....	41
1. Promoting competition in the "retail DA market" would not improve local competition.....	41

2. The demand for full service provision of telecommunications services (i.e., one-stop shopping) implies that few customers would be interested in presubscribing to DA services. ....	42
a. Consumers are not likely to be interested in 411 presubscription. ....	45
3. The structure of the US telecommunications industry has contributed to dynamic innovative competition, without the regulations suggested by Telegate. ....	45
a. The development of competition for NDA and EDA services. ....	46
b. Competition among wireless DA, Internet directory sites and wireline DA providers has added substantial market place pressure in the US to develop even more innovative services. ....	46
4. The Frost & Sullivan report provides useful data. ....	47
IV. INTERNATIONAL INSTITUTIONAL AND MARKET CONDITIONS DIFFER SUBSTANTIALLY FROM THOSE IN THE US; THUS, THE FCC SHOULD NOT EMULATE OTHER COUNTRIES' DA POLICIES. ....	48
A. Despite institutional and market structure differences that have limited the degree of DA competition in other countries, none has adopted presubscription for DA. ....	48
B. The Oftel decision does not apply to competitive circumstances in the US. ....	50
1. The central premises on which Oftel's decision is based do not apply in the US. ....	50
a. Fundamental market structure differences imply that, unlike UK consumers, US consumers are able to access DA services from numerous strong competitors. ....	50
b. Oftel's concerns about value added DA services and service quality have little if any relevance to the US. ....	51
c. The UK starts with less DA competition and value added services; thus, the incremental benefits are likely to be much smaller in the US. ....	52
2. Oftel's market research does not imply that US policies should be changed; indeed, it suggests that it is not necessary to eliminate the 411 code. ....	53
3. The cost-benefit analysis done for Oftel does not apply to the US. ....	54
C. Experience in other countries does not support Telegate's proposal in the US. ....	55
1. US competitive and regulatory conditions differ from those in countries that have adopted some form of DA changes in dialing code policy. ....	55
a. Regulatory conditions differ. ....	55
2. The two-tiered US regulatory structure means that implementing drastic changes in DA dialing patterns would be more costly here than in Europe. ....	56
3. The majority of EU members have not adopted policies such as those recommended by Telegate. ....	56
V. ASSESSING COSTS AND WHO SHOULD PAY FOR IMPLEMENTING DA POLICY CHANGES IF THE COMMISSION WERE TO ADOPT THEM. ....	57
A. Economic principles imply that those who demand and benefit from an activity must pay for the associated costs. ....	57
B. The costs of DA dialing code changes requested by Telegate require a comprehensive, detailed analysis. ....	57
1. The direct costs of dialing code changes include numerous components. ....	57
2. The indirect costs of dialing code changes could be large. ....	59
3. The indirect costs of asymmetric regulation should also be considered. ....	60
C. Conclusion. ....	60

## **I. BACKGROUND, PURPOSE AND SUMMARY OF CONCLUSIONS**

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.

I have been an economist for over twenty-five years. I 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 filed testimony before many state public service commissions, 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. I have also been 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 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. A copy of my resume is attached as Exhibit 2.

My name is Harold Ware. I am Vice President of National Economic Research Associates, Inc. (“NERA”). Since joining NERA, I have directed studies and prepared testimony for regulatory proceedings and antitrust cases. My research has focused on telecommunications, including: studies of competition in the local, interexchange, Centrex/PBX, and private line markets; studies of pricing, costs and entry policy, and universal service issues associated with the transition to competition; analyses of regulatory policy on stranded plant; analyses of competitive effects of mergers in wireless telecommunications and between telephone and cable TV companies; and analyses of the planning and deployment of new technology in telecommunications networks. I have also studied competition and demand for postal services and the impact of postal rate changes. I have testified before state regulatory commissions and the U.S. Postal Rate Commission, and filed affidavit testimony before the FCC and the Department of Justice. I also directed and was coauthor of an international comparison of regulation and competition submitted by Telecom New Zealand to the New Zealand Ministerial Inquiry into Telecommunications.

I received a B.A. *cum laude* in Economics from the State University of New York at Stony Brook, and M.A. and Ph.D. degrees in Economics from Cornell University. While pursuing

my graduate studies at Cornell, I taught courses in economics and industrial organization and did research on cellular mobile communications in the Technology Assessment Project of the Program on Science, Technology, and Society. My articles have been published in *Public Utilities Fortnightly*, *The Journal of Regulatory Economics*, *IEEE Communications*, proceedings of the *Fifth and Seventeenth Annual Telecommunication Policy Research Conferences*, and in *Managing Change in the Postal and Delivery Industries*. I am also co-author of three chapters of *Communications for a Mobile Society: An Assessment of New Technology*. A copy of my resume is attached as Exhibit 3.

We have been asked by BellSouth, SBC, Qwest, and Verizon (“the major ILECs”) to assess the economic aspects of the competition and regulatory policy issues raised in the FCC’s Notice of Proposed Rulemaking on 411 presubscription (“the NPRM”). In particular, the purpose of our report is to:

- 1) Describe the economically correct policy framework for assessing:
  - the potential costs and benefits of the policy options;
  - competition, entry barriers and market power; and
  - the recovery of costs for presubscription or other DA dialing alternatives.
- 2) Describe and evaluate the status of competition for DA services and whether additional steps are needed to ensure that the DA market is open to competition. In doing so, we assess:
  - the relationship between the effectiveness of competition in the retail DA market and local exchange competition in general; and
  - whether the current use of the 411 code is a barrier to entry.
- 3) Assess the context for the UK and other European DA dialing policies and how they compare with the US situation.
- 4) Explain the principles for assessing who should pay for such policies, if the Commission were to adopt them.

Our analysis demonstrates that:

- 1) DA services are already extremely competitive in the US.
  - Numerous firms provide DA services or substitutes that compete with ILEC DA services without using the 411 code—including telephone-based DA providers, directory publishers, direct on line services and Internet directory sites, and CD-ROM directories;
  - The characteristics of available substitutes make them, in many ways, superior to conventional ILEC DA services;
  - Competitors have been growing vigorously as ILEC DA volumes have declined; and
  - There are no substantive barriers to entry.

- 2) The market place trend to full service provision or “one-stop shopping” for local, toll, Internet and other services indicates that consumers are not likely to find enough value in presubscription to 411 service, or other DA dialing alternatives, to justify a large cost outlay.
- 3) The level and nature of competition show that the 411 code is not an essential component of competitive DA services and that the incremental benefits of either presubscription to 411 services or other changes in DA dialing code policy are not likely to warrant substantial incremental costs in the US.
- 4) There are significant institutional and market differences between the US and the European countries mentioned in the NPRM. These differences indicate that policies that may have been warranted to promote competition for DA services in European countries do not appear to be justified in the US. For example, Oftel’s policy decision appears to be predicated on conditions that do not apply in the US, including the UK’s lack of DA competition, its dearth of advanced DA services, as well as the lack of presubscription to toll carriers in the UK—which is one of several major institutional and market place differences between the US and UK.
- 5) Even though the case for stimulating competition for DA services may have been stronger in the European countries that have changed their DA dialing codes—because they had and still have less competition than in the US for DA services—none of these countries opted for presubscription to DA services. Thus, the relevant lesson from these countries, if there is one, is that presubscription is too costly to justify the potential benefits, even where DA markets are less competitive and innovative than in the US.
- 6) According to economic principles, costs should be recovered from the entity that causes costs to be incurred. If, in this case, the FCC were to decide—incorrectly in our view—to change the dialing arrangement for DA services, then the costs for doing so should be recovered from the cost causing agent—i.e., the companies that request and benefit from the new policy and/or their customers.
- 7) Under competitive market principles incumbents are not forced to eliminate their historical brands or change and constrain their service characteristics to stimulate entry. Entrants in competitive markets must incur their own marketing costs to establish their brand names and publicize their service characteristics to consumers. There is no justification for departing from this normal competitive process; specific telephone numbers are not essential facilities. The effective operation of normal market processes for DA service is demonstrated by the existence of competitors that have already incurred the costs to enter the DA market and promote their brands and DA telephone numbers.

**II. THE ECONOMICALLY CORRECT FRAMEWORK FOR ASSESSING THE ISSUES RAISED IN THE NPRM IS TO EXAMINE THE INCREMENTAL COSTS AND BENEFITS GIVEN THE CURRENT STATUS OF COMPETITION.**

**A. The Commission should compare the incremental benefits with the incremental (direct and indirect) costs.**

The correct approach to evaluating potential changes in DA dialing patterns is an incremental cost and benefit approach. The economically correct policy framework therefore requires a comparison of the incremental benefits with the incremental (direct and indirect) costs. The major ILECs estimate substantial direct costs for these policies—including implementation costs for network modifications, customer education, balloting, OSS changes; and ongoing added costs for billing and customer service that would increase under the proposals being considered. In addition, the costs faced by smaller ILECs that have taken fewer steps to modernize their networks may be relatively high for them. The indirect costs include potential negative economic impacts on DA consumers—such as cramming and slamming. (See Section V below for a discussion of the cost issues.)

In considering the costs and benefits, it is also important to keep in mind that the potential benefits will be limited because the average number of DA calls is quite low, less than two per month,<sup>1</sup> and the distribution is quite skewed. According to BellSouth, 80 percent of BellSouth residential DA customers make one or fewer DA calls per month. Verizon-Massachusetts reports that almost 62 percent of its customers make one or fewer DA calls per month. Qwest studies show 5 percent of customers make about 80 percent of DA calls. Verizon data for Massachusetts show that 8.5 percent of its customers make 60 percent of DA calls.<sup>2</sup> Thus, implementing a blanket policy that would benefit only a small minority of customers but could impose costs on many customers is unwarranted.

**B. The Commission should take a forward-looking approach to evaluating competition that recognizes the historical role of regulation.**

To assess whether a firm faces effective competition for a service, economists consider whether: (1) current competitors can supply sufficiently close substitutes to the service to prevent a small but significant price increase above the competitive level;<sup>3</sup> or (2) entry barriers are sufficiently low that the threat of new entry can itself discipline the market price. In either

---

<sup>1</sup> See Section II.B.3 below.

<sup>2</sup> Ex Parte presentation of BellSouth, Qwest, SBC and Verizon, 411 Facts and Issues Opposing Presubscription, December 14, 2000, p. 3.

<sup>3</sup> The price increase contemplated by economic theory is an increase over *competitive* prices. Note also that in many states, regulation of calling allowances and rates continues to keep DA rates below competitive levels; thus, a price increase would be associated with a move towards competitive rates.

case, competition will be sufficiently effective to replace regulation as the vehicle for protecting consumers. Thus, gauging whether effective competition exists for DA services requires an examination of (i) the availability of substitute services—including evidence that competitors are presently providing DA or substitute services (or possess the ability to rapidly provide such services) in competition against incumbent companies; and (ii) the ease of entry into the market.

It is particularly important to consider evidence of whether competitors can rapidly provide services and whether entry is easy in markets recently opened to competition or in markets that have been subject to price regulation or constraints that have held prices below competitive levels—e.g., by requiring DA providers to maintain an allowance for free DA calls. In such cases, market share measures typically overstate the market power, if any, of the incumbents. Thus, the analysis should not focus solely on static market structure data from the recent past, although, as we will demonstrate, even those data show that competition is already present in the areas served by the major ILECs throughout the country.

The regulatory context should also be considered because regulation, together with underlying market conditions, affect supply and entry conditions. For example, it is significant that the ILECs must provide non-discriminatory access and pricing to their DA databases. This factor, combined with the extensive competition for the provision of wholesale DA services and the availability of numerous substitutes for retail DA services, effectively eliminates the ILECs' ability to raise prices above competitive levels for retail DA services.

### **1. Identifying economic substitutes and competitors.**

The availability of substitute services is important because when sufficiently good substitutes are available, firms cannot profitably raise prices above competitive levels. This will be the case if enough customers would respond to such a price increase by shifting to one or more substitute services (or simply stop using the firm's service), and the price increase would not be profitable. Similarly, if the quality of a firm's service deteriorates, customers will seek service from other competitors who are already providing service or can readily do so.

Economists and government agencies take account of such factors as facilities and existing customer relationships when they assess whether competitors are present in a market. For example, in discussing the use of collocation to assess the presence of competition, the FCC itself stated:

Once multiple rivals have entered the market and cannot be driven out, rules to prevent exclusionary pricing behavior are no longer necessary. Investment in facilities, particularly those that cannot be used for another purpose, is an important indicator of such irreversible entry. If a competitive LEC has made substantial sunk investment in equipment, that equipment remains available and

capable of providing service in competition with the incumbent, even if the incumbent succeeds in driving the competitor from the market.<sup>4</sup>

Moreover, the United States Department of Justice (“DOJ”) has recognized that where a firm can enter the relevant market within a year without significant sunk costs, it may be more appropriate to consider the firm to be a participant in a market as opposed to merely a potential competitor.<sup>5</sup> Thus it is appropriate to include firms as competitors if they can diversify from a related product or adjacent geographic market into the market in question. For example, long distance carriers have established relationships with business and residence customers to whom they have provided DA services associated with long distance and intraLATA toll services can rapidly provide local DA services. (Indeed, this is what the major IXCs have done by including local DA in their “00” customer services which in the past had been limited to long distance call completion. Similarly, Internet providers such as AOL and Yahoo also now market “By Phone” services that enable their customers to obtain a variety of information by calling a telephone number and could readily use those existing relationships to compete with ILEC DA services.) Thus, competitive alternatives to ILEC DA services include not only IXCs and other providers that already market local DA services but also those that now have ongoing relationships with customers through which they could readily market local DA services. Any national DA service obviously can also provide local DA listings so such services directly competed with ILEC DA as shown by the fact that these expanded services have captured local DA calling volumes even though they do not utilize the 411 dialing code for service access.<sup>6</sup>

---

<sup>4</sup> Federal Communications Commission Common Carrier Bureau, *Fifth Report and Order*, CC Docket Nos. 96-262, 94-1, 98-157 and CCB/CPD File No. 98-63, FCC 99-206 (August 27, 1999), ¶ 80.

<sup>5</sup> According to the DOJ Merger Guidelines, Sections 1.321 and 1.322:  
 .... If a firm has existing assets that likely would be shifted or extended into production and sale of the relevant product within one year, and without incurring significant sunk costs of entry and exit, in response to a “small but significant and nontransitory” increase in price for only the *relevant product, the Agency will treat that firm as a market participant*. In assessing whether a firm is such a market participant, the Agency will take into account the costs of substitution or extension relative to the profitability of sales at the elevated price, and whether the firm’s capacity is elsewhere committed or elsewhere so profitably employed that such capacity likely would not be available to respond to an increase in price in the market.

1.322 Obtaining New Assets for Production or Sale of the Relevant Product. *A firm may also be able to enter into production or sale in the relevant market within one year and without the expenditure of significant sunk costs of entry and exit*, in response to a “small but significant and nontransitory” increase in price for only the relevant product, even if the firm is newly organized or is an existing firm without products or productive assets closely related to the relevant market. *If new firms, or existing firms without closely related products or productive assets, likely would enter into production or sale in the relevant market within one year without the expenditure of significant sunk costs of entry and exit, the Agency will treat those firms as market participants*. [emphasis added.]

See also Landes and Posner who recognize the importance of supply substitution and entry. William M. Landes and Richard A. Posner, “Market Power in Antitrust Cases,” *Harvard Law Review*, Vol. 95, pp. 945, 962-3 (1981).

<sup>6</sup> See Section III.A.1.

Substitutes need not be identical to the service at issue. The economic question is whether the *set* of available substitutes jointly provides viable alternatives for consumers. All that is required is that customers can purchase a service or services from other providers and that the service(s) would fulfill the same function for them as the incumbent's service(s). A spectrum of alternatives may offer viable competitive options. Customers may be willing to purchase a service at a higher price from one competitor rather than a similar service from another if they believe that the more expensive service is higher in quality or offers a unique feature. A customer may purchase a Seiko watch instead of a Timex if he or she believes that the Seiko is more reliable, even if it costs more. For example, customers may choose a competitor's DA service because they may believe it to be more user friendly—e.g., to have better access to an operator—even if it is more expensive or uses a different dialing code than the ILECs' DA service. The customer could also find a lower quality or less convenient substitute more desirable at a lower price.

Thus, it is not necessary that every substitute for traditional telephonic DA service provides the exact same data or can be accessed in precisely the same manner. A set of substitutes that differ in various ways from the service under analysis can jointly constrain demand for a particular service. If enough people are willing to substitute from one service to others, even though the attributes are different and they are priced quite differently, then the substitutes taken together can constrain the price of the service at issue. It is not necessary that *each individual* substitute product or service be essentially the same as the service under analysis.

## 2. Assessing barriers to entry

As the Commission recognizes in the NPRM (at ¶ 1) by requesting comments on whether the DA “market is sufficiently *open* to competition that further regulatory action is unnecessary,” ease of market entry or expansion is relevant in considering whether a market is competitive. Economic principles and experience teach that with low barriers to entry or expansion, the presence of above-normal profits in a market would attract entrants and/or allow existing smaller firms to expand the supply of services and reduce prices to competitive levels. In this case, market entry is sufficient to constrain an incumbent's prices and, thus, the ease of market entry is a relevant means of gauging the effectiveness of competition.

Economists evaluate ease of entry into a market by assessing competitors' ability to enter a market or expand their presence in a market within a reasonable period of time in response to potential efforts by an incumbent to raise prices above competitive levels. Economists assess entry barriers by examining the costs faced by an entrant but not by the incumbent. The smaller these costs are, the lower and less significant are the entry barriers. If *sunk* costs—*i.e.*, costs that an entrant must incur to enter or expand and cannot recover if it subsequently leaves the market—are low relative to the potential profit opportunity, entry barriers will also be considered low. Economists also consider whether, in regulated industries, regulation itself hampers entry and expansion by new competitors.<sup>7</sup>

---

<sup>7</sup> We note that the 1996 Act prohibits regulations that hinder entry.

To find low barriers to entry, the DOJ's Merger Guidelines require that competitive entry be "timely, likely and sufficient in its magnitude, character and scope to deter or counteract the competitive effects of concern."<sup>8</sup> According to the Guidelines:

The Agency will consider timely only those committed entry alternatives that can be achieved within two years from initial planning to significant market impact.<sup>9</sup>

Thus, for policy purposes, ease of entry does not mean that competitors face no costs or that they can instantly enter a market. Further the fact that firms have incurred such costs demonstrates that they have determined that such costs are warranted by the business opportunity presented.

Thus, ease of entry can be assessed by examining: (1) the level and growth of competition for a product or service as measured by, for example, the number of competitors in the market and the number of customers they serve; (2) whether competitors have invested in facilities to deploy a service; and (3) the regulatory and economic conditions that affect entry such as, for example, the technical ability of firms to expand readily their array of services and/or their geographic scope of service.

It is sufficient to examine the third measure alone to assess ease of entry, because entry may be easy even if there is no evidence of current competition or investment to provide the service at issue. Therefore, a small number of competitors in a recently opened market does not mean that entry barriers are high; however, substantial entry, investments, and growth by competitors, such as those we describe later, provide clear evidence of ease of entry.

### **3. High market share does not denote market power in historically regulated markets.**

Economic principles do not support placing substantial reliance on market share or related market power measures to assess the efficacy of the competition facing historically regulated firms. Market share data may understate the success of competing telephonic carriers, for example, because the data are distorted by historically low rates charged to residence customers by a number of ILECs as a result of regulatory policies. Indeed, where a traditionally regulated monopoly is exposed to competition, market shares (or other concentration measures<sup>10</sup>) are particularly poor indicators of market power. Landes and Posner make this point quite forcefully:

---

<sup>8</sup> DOJ Merger Guidelines, *supra*, note 13.

<sup>9</sup> *Ibid*, at 51.

<sup>10</sup> Besides market share, economists use the four- or eight-firm concentration ratio (the market share of the largest four or eight firms combined), and the HHI (the sum of squared market shares of all firms in the market) to measure concentration.

Regulation may increase a firm's market share in circumstances where only the appearance and not the reality of monopoly power is created thereby. For example ... price may be above marginal cost in some markets and below marginal cost in others. In the latter group of markets, the regulated firm is apt to have a 100% market share. The reason is not that it has market power but that the market is so unattractive to sellers that the only firm that will serve it is one that is either forbidden by regulatory fiat to leave the market or that is induced to remain in it by the opportunity to recoup its losses in its other markets. ... ***In these circumstances, a 100% market share is a symptom of a lack, rather than the possession, of market power.***

***Notice in this case that the causality between market share and price is reversed. Instead of a large market share leading to a high price, a low price leads to a large market share; and it would be improper to infer market power simply from observing the large market share.***<sup>11</sup>

This consideration means that any measure of current DA market shares would tend to overstate the ILECs' share(s), because regulators have historically required ILECs to keep their local DA prices below market levels by requiring free local DA calls and/or setting rates that may not fully recover costs. This factor continues today, even though local DA rates are moving toward more competitive levels as a growing number of states have reduced or eliminated regulation of local DA services. Thus, many of the major ILECs' rates for local DA calls are well below the unregulated prices charged for DA calls and likely below the marginal cost of DA calls. In fact, an analysis of the major ILECs' local DA rates for 1.95 (i.e., the average number of ) local DA calls per month<sup>12</sup> shows that: (1) the average charge per DA call is less than 43 cents per call and the median residence charge only about 23 cents per DA call in the U.S. when the residential calling allowance is factored in<sup>13</sup>; (2) average charge per call for business DA calls when the business DA calling allowance is factored in is 60 cents and the median business charge only about 50 cents per DA call; (3) the price per residence DA call is less than the estimated wholesale price of 28 cents per call in 28 states; and (4) the price per business DA call is less than the estimated wholesale price in 14 states. (Exhibit 1.0 summarizes the current rates and regulatory status of the major ILECs' local DA services by

<sup>11</sup> William M. Landes and Richard A. Posner, "Market Power in Antitrust Cases," *Harvard Law Review*, Vol. 95, pp. 975-976 (1981), footnotes omitted (emphasis added).

<sup>12</sup> 1.95 calls per month represents the average number of calls made per access line. Average number of calls per month calculated by dividing the total number of local DA calls reported by Frost & Sullivan for year 2000 by the total number of switched U.S. access lines reported by the FCC as of December 31, 2000. See Frost & Sullivan, "Market Engineering Research for the U.S. Wireline Directory Assistance Services Market 1996-2006 6044-63," p. 47 (2000); Federal Communications Commission Common Carrier Bureau Industry Analysis Division, "Local Telephone Competition: Status as of December 31, 2000," Table 1 (May 2001).

<sup>13</sup> Data on state calling allowances and local DA prices obtained from Telcordia Technologies and the major ILECs (February 14, 2002). See Exhibit 1 for details of the calculation of average rates and state-specific data on calling allowances and rates. Estimated average wholesale DA price obtained from Frost & Sullivan. See Frost & Sullivan, "U.S. Wholesale Directory Assistance Services Market 6046-63," p. 21 (2000).

state.) These data show that regulation has kept local DA rates artificially low, and has likely reduced efforts to compete for local DA services. Thus, even if—contrary to the analysis below—the Commission were to find that ILECs still had a high market share, that would not mean that DA services were not open to competition or that competition would not be effective in states that have reduced DA regulation.

As it turns out, when the ILEC 411 (and 555-1212) share of DA services is assessed correctly—i.e., when we include all of the relevant substitutes and consider the dramatic decline in ILEC DA volumes—it seems quite clear that the ILEC telephonic DA services retain only a minority of the market (See Section III.A below). Thus, even though their current retail DA calling volume shares would be biased upwards because regulators require ILECs to exempt many local DA calls from charges and because many states still keep rates below cost—e.g., by requiring free DA calls for residence customers in 30 states, and by regulating the DA rates in a declining but still substantial number of states<sup>14</sup>—the available data (summarized in Section III below) show that the ILECs face substantial competition for retail DA services.

Further, in assessing competition, the Commission should account for market trends and likely future developments. Although we focus on substantial evidence regarding current competition, the Commission should also consider likely future events—*e.g.*, expansion of competitors such as wireless mobile services—that will affect future competition but nonetheless constrain the incumbent’s actions in the present. Where entry and expansion are not encumbered, incumbent firms—even in markets without current competitors—are not likely to profit from raising prices above competitive levels. Such efforts would merely attract new competitors that would expand supply and render the price increase unprofitable. Further, even if it were the case that incumbents retained the majority of customers, the fact that a substantial number of customers have already switched and that competitors have been growing indicates that existing services are viable substitutes.

### **C. Assessing who should pay for implementing DA policy changes, if the Commission were to adopt them.**

Costs should be recovered from the party or parties that cause the costs to be incurred and that benefit from the resources demanded or utilized for a given product or productive input. Violating this basic principle of economics reduces economic efficiency. Thus, as explained in Section V below, those demanding a change in policy to facilitate their ability to capture customers should pay for the costs of implementing that policy.

## **III. DA SERVICES ARE ALREADY COMPETITIVE IN THE US.**

In this section, we describe the structure of the DA market in the US, identify the nature of the competition and the evidence that competition is thriving. In doing so, we respond to the

---

<sup>14</sup> See Exhibit 1 below.

request for comments on “... the distinction between the wholesale and retail DA markets so that we can consider whether a separate competitive analysis for the latter is justified.” (NPRM at ¶13) As explained below, firms that currently provide wholesale DA services can be considered to be participants in the retail DA market, under applicable DOJ standards; thus, an analysis of their capabilities is justified. Further, the strong competition for wholesale DA services bolsters competition for retail services, as explained in this section.

### **A. Overview of retail and wholesale DA services and substitutes.**

We begin by identifying the DA services and substitutes:

- Retail services—i.e.,
  - Wireline Telephonic DA:
    - Local DA = ILEC + CLEC + IXC (pre-subscribed, 1-800 and 1010 equal access dialing) + independent DA provider services.
    - National DA = IXC (pre-subscribed, 1-800) and 1010 equal access dialing + ILEC + CLEC + independent DA provider services.
  - Internet directory sites,
  - CD-ROM directories,
  - Printed directories,
  - Wireless DA.
- Wholesale services—i.e., DA platforms and database services provided by:
  - Integrated providers that use their own DA platforms and call centers to provide DA services
    - in conjunction with their own local and/or toll telecommunications services; and
    - to other telecommunications service providers—e.g., to CLECs.
  - Firms specialized in providing DA services that are resold by retail telecommunications competitors. These include:
    - Full service DA providers whose services are resold by telecommunications service providers (i.e., LECs, IXCs, and wireless mobile carriers); and
    - Firms specializing in providing elements of DA services—e.g., firms that assemble nationwide DA databases used by other DA service providers.

Although the NPRM appears to focus primarily on “retail” DA services, wholesale DA services are relevant because competition and ease of entry for wholesale services have important implications for retail competition; and because the lines between wholesale and retail DA services have become blurred as firms who had specialized in wholesale DA services have

already begun to provide retail DA services.<sup>15</sup> Wholesale services are often provided to end users on a transactional basis and therefore, the same resources and systems to provide wholesale services (including databases, call platforms and operators) can also be readily employed to serve end users on a retail basis.

The thriving competition for wholesale DA services:

- Facilitates retail competition because firms wanting to provide retail DA services can simply purchase DA services—or DA service elements such as database access—at wholesale rates without having to set up their own call center, database, etc.;
- Ensures that rates for wholesale services will be reasonable; and that service quality will be high. Ease of entry into the provision of wholesale DA, as well as the existence of multiple wholesale providers, ensures that existing wholesale providers cannot exercise market power or impede competition for retail services;
- Has contributed to the development of expanded and specialized DA services, especially as they compete to provide wholesale services for major wireless companies. This development will further spur competition between wireless and wireline retail DA services.

Furthermore, as explained in section III.A.5 below, wholesale DA service providers can and have entered the retail DA market. Many already serve business customers and payphone service providers. End users may directly dial the number provided by the wholesale provider for access or alternatively, the business customer can choose the number to be dialed by their end users by programming premises equipment and payphones to route those calls to the provider.<sup>16</sup> An example is Info Save offered by INFONXX. That same firm is also developing a retail wireline telephone service that finds the telephone numbers of wireless mobile subscribers and automatically routes calls to those customers. That service evidently would use the 555 1818 code. (See discussion of INFONXX below.) Other wholesale providers also provide retail service via web sites<sup>17</sup> and CD-ROMs.<sup>18</sup>

Therefore, some wholesale DA providers (i.e., those providing an entire DA platform) may be considered to be participants in the residence retail market, under the DOJ Merger Guideline approach, because they are already set up to offer complete DA services and could serve

<sup>15</sup> See discussion of INFONXX's InfoSave retail DA service and Telegate's Dedicated DA product for business customers in section II.B.5.

<sup>16</sup> For example, independent DA providers offer DA to business customers whose equipment routes the DA calls via an 800 number or a direct connection to the independent DA provider rather than an ILEC or an IXC. See section III.A.5 and discussion of eData.com below.

<sup>17</sup> eData.com, <http://www.edata.com> (accessed March 26, 2002).

<sup>18</sup> See "Directory Assistance Products, infoUSA.com," [http://list.infousa.com/cgi-bin/abicgi/abicgi.pl?bas\\_session={bas\\_session}&bas\\_vendor=190000&bas\\_type=lc&bas\\_page=999&bas\\_action=directory\\_assist](http://list.infousa.com/cgi-bin/abicgi/abicgi.pl?bas_session={bas_session}&bas_vendor=190000&bas_type=lc&bas_page=999&bas_action=directory_assist) (accessed March 26, 2002).

residential customers with little incremental costs within a year using an 800 number to provide access to their DA service; or using a 10-10 number to provide DA together with (resold) toll services.

Although the services include “local DA” and “national DA,” competition takes place in a nationwide market in which traditional local DA providers face competition from national providers—e.g., IXC DA services and Internet service providers. This is the case because DA providers with calling centers located any place in the US (or in other countries) can serve customers located throughout the US and because Internet providers anyplace in the world can compete to serve every customer with Internet access. Indeed, the IXCs offering “national DA” compete to provide local DA listings, and LECs compete to provide national DA listings. (See section III.A.8 below.)

## **B. The market includes numerous DA providers in every region.**

As explained in section II, economists assess the degree of competition in a market by considering whether the availability of substitute services and the potential for entry by new providers can constrain the ability of a firm to raise prices above competitive levels. Numerous competitors already provide services that compete with ILECs’ DA services without using the 411 code—including telephone-based DA providers, directory publishers, and providers of online and CD-ROM services.

In the balance of this section, we describe the substitutes and demonstrate that they not only foster the development of competing services and innovations desired by consumers, but constrain the ILECs’ ability to raise prices above competitive levels. We rely on two types of evidence:

1. An analysis of the availability and attributes of substitutes for traditional LEC DA services that demonstrates that although the substitutes are not identical—e.g., some are not accessed via telephones—it is clear that their combination of attributes makes them attractive substitutes to numerous customers; and
2. An analysis of DA calling volumes that reveals declining retail and wholesale DA for major ILECs at the same time competitors’ DA volumes have increased.

In section C, we show that there are no substantive entry barriers.

### **1. Many wireline telephonic DA providers compete in every state.**

The number of firms providing DA services extends beyond those that compete to provide wireline telephonic DA services; however, even when we take this excessively narrow view, the data show that numerous firms compete to provide DA services in every state.

First, numerous long distance carriers and others compete to provide retail telephonic DA services to ILEC customers in every state. Thus, *a minimum* of four major firms compete in

the major ILEC service areas to provide retail DA services to the ILECs' local customers—the ILEC, AT&T, WorldCom and Sprint. (Of course many more long distance carriers provide DA services to ILEC local customers.<sup>19</sup>) The long distance carriers can be reached by any of their toll subscribers by dialing Area Code + 555-1212. In addition, customers of AT&T, Sprint and WorldCom can obtain DA service by dialing 00; and, AT&T, WorldCom and Sprint offer DA service to any customer by dialing 10-10-ATT-00 or 10-10-9000, via 1010 3330, respectively. AT&T can also be reached by dialing 1 800 CALL ATT. This access code allows customers to make DA calls and other calls that can be charged to an AT&T calling card or to an ordinary credit card. Finally, other toll service providers also offer access to their directory assistance services via 10-10 dialing. For example, VarTec's 10-10-811 service offers national DA service for \$1.49 per call.<sup>20</sup>

Besides these competitors, INFONXX offers DA services directly to businesses, as do Telegate and eData.com.<sup>21</sup> INFONXX is also deploying a new service in some regions that will be reached by dialing 555-1818, or another 555 code. This service is an innovative offering to provide callers with a means of contacting wireless mobile customers whose number is not known to the caller. It offers the called wireless party the option of taking the call and will bill the calling party for the wireless charge. Thus, the service combines DA service functions with calling party pays wireless service. In addition, it has significant implications for this proceeding—i.e., it shows that a major wholesale DA provider is developing a new retail “wireless white pages” service that can be accessed by wireline customers using a code other than 411 or 555-1212.<sup>22</sup>

Second, many additional firms compete with ILECs to provide DA services in conjunction with their other telecommunications services. Besides the firms that compete to provide DA

---

<sup>19</sup> For example, Excel and Vartec offer their long distance customers DA service through the NPA + 555-1212 dialing arrangement for \$1.25 and \$1.49 per call, respectively. Source: Conversations with Excel Telecommunications and VarTec Telecom (March 18, 2002).

<sup>20</sup> Source: VarTec Telecom (March 18, 2002).

<sup>21</sup> See Section III.B.5.

<sup>22</sup> According to Morningstar.com, “The company innovated a wireless white pages service called 555-1818, offering carriers solutions for wireless listing clean-up and management, subscriber privacy guarantees, a single access number for all listings and a billing clearinghouse function.” See: “Verizon Wireless Chooses INFONXX for Enhanced Directory Assistance,” <http://news.morningstar.com/news/BW/M01/D07/1010434263611.html>, obtained 3/13/2002 The INFONXX Web site description of “Mobile Source” announces that: “Until now, directory assistance has not enabled users to locate wireless numbers. Connecting with a wireless phone is impossible unless you have the number. A trusted partner to top wireless companies, INFONXX is the nation’s only directory assistance provider to offer this service.” According to a telephone call to INFONXX March 13, 2002, the service is in trials now and will use a 555 XX XX access code. An INFONXX Press Release, “INFONXX and VoltDelta Partner on Technology For New Wireless Directory Assistance Service” (February 27, 2002) states that: “For the first time, MobileSourceSM makes it possible for callers to reach individual wireless subscribers without knowing their numbers in advance.... Subscriber numbers are not shared with the caller; instead, the call is announced to the recipient, who has the options of accepting, declining or routing the call to voice mail. Regardless of the option chosen by the called party, they pay nothing for the call. The service is billed on the caller's monthly bill.” Obtained from INFONXX.com, (March 13, 2002)

services to ILEC local customers, and perhaps more important, because of the substantial demand for one-stop shopping—i.e., for obtaining local, toll and other telecommunications services from a single provider—the data show that the growth of numerous competitors providing local exchange and other services (along with DA services) has increased competition for DA services.

CLECs have competitive choices from which to purchase or self provision their DA services. Data tabulated below show that numerous CLECs compete for retail DA services by using the ILECs' underlying DA service platform. However, many CLECs have opted to use wholesale providers other than the ILECs. Thus, those currently using ILEC wholesale DA services do so by choice, and can certainly switch to other DA wholesale providers to differentiate their retail DA services from those of the ILECs. Although the data were not available for every ILEC, many DA providers do not rely on the ILEC DA platforms. For example, data for Verizon's former Bell Atlantic states show that in 94 interconnection agreements with active facilities-based CLECs, these CLECs use their own DA platform and call centers or use wholesale services provided by a competitor other than Verizon. This represents approximately 40% of all interconnection agreements or an average of seven (7) CLECs in each of those 13 states.<sup>23</sup> Similarly, Bellsouth statistics illustrate that an average of more than twelve active UNE P CLECs are using DA service provided by someone other than BellSouth in its nine state region.<sup>24</sup>

The table below summarizes data on the distribution of CLECs purchasing wholesale DA services from major ILECs in conjunction with: (1) the resale of switched local service; (2) UNE P purchases; and (3) facilities-based local service provision via their own switches. It shows that:

- In every state for which data were available, at least one CLEC was using each of the options.
- 23 or more CLECs were purchasing DA services to use with resale of switched services in more than half of the states for which data were available.
- Six or more resellers were using wholesale DA services in over three fourths of the states for which data were available.
- Five or more facilities-based competitors were using ILEC wholesale DA services in over three fourths of the states for which data were reported.

---

<sup>23</sup> Source: Verizon wholesale DA and facilities-based CLEC data.

<sup>24</sup> Source: BellSouth wholesale DA and UNE P data.

**Table 1: Many CLECs Utilize Wholesale DA Services Provided by the Major ILECs**

<b>Resellers</b>	
<b>Number of CLECs</b>	<b>Number of States</b>
2-4	8
9-20	11
23-50	17
>50	12
	<b>Number of Resellers in Each State</b>
<b>Mean</b>	35
<b>Median</b>	29
<b>Number of States Reporting</b>	48

<b>CLECs Purchasing UNE Ps</b>	
<b>Number of CLECs</b>	<b>Number of States</b>
3-5	7
6-10	12
11-20	13
>20	4
	<b>Number of UNE P CLECs in Each State</b>
<b>Mean</b>	13
<b>Median</b>	10
<b>Number of States Reporting</b>	36

<b>Facilities-based CLECs Purchasing Major ILEC DA Service</b>	
<b>Number of CLECs</b>	<b>Number of States</b>
1-4	8
5-10	10
15-18	5
>20	13
	<b>Number of Facilities-based CLECs in Each State</b>
<b>Mean</b>	17
<b>Median</b>	13
<b>Number of States Reporting</b>	36

Note: We are not able to report data on the UNE P and facilities-based CLECs purchasing RBOC DA in SBC's twelve state region as a result of SBC reporting conventions. All statistics exclude data for the former GTE footprint.

## 2. Wireless DA is capturing a growing share of DA calls.

Any customer with a wireless mobile phone can obtain local or national DA services from his or her wireless provider. The US already has over 132.5 million wireless mobile telephone subscribers,<sup>25</sup> and the number is still growing rapidly—about 26 percent per year from June 2000 to June 2001.<sup>26</sup> As recently noted in an article in *Business Week*, users of wireless phones are generally more likely to seek directory assistance “because you don’t have a phone book next to you.”<sup>27</sup> Thus, as the growth in wireless DA volumes clearly indicate, wireless subscribers are very familiar with this alternative source of DA service.

One study shows that wireless DA revenues already approach those of ILECs and CLECs combined, and wireless DA volumes are already about 20 percent as large as total local and long distance wireline DA volumes.<sup>28</sup> Further, wireless DA services offer many useful features such as category or yellow pages type searches and listings of businesses based on location. This is an important competitive advantage because the vast majority of DA inquiries (about 85 percent according to one study) are for business telephone numbers.<sup>29</sup>

These factors have led to the substantial use of wireless DA services and the number of wireless DA calls has been increasing.

	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Wireless DA Calls	543.1	600.0	669.5	753.8
Annual Growth		10.5%	11.6%	12.6%

Source: Frost & Sullivan, “Wireless Directory Assistance Services Market, 2001-2007 6051-63” (2001).

In addition, although the forecasts vary as to the precise level of calls and revenues, market research studies forecast that wireless DA volumes and revenues will continue their strong growth. Forecasts of future annual growth in wireless DA volumes range from 16.5 percent to

<sup>25</sup> Cellular Telecommunications & Internet Association, <http://www.wow-com.com> (March 15, 2002).

<sup>26</sup> Federal Communications Commission Common Carrier Bureau Industry Analysis Division, “Local Telephone Competition: Status As Of June 30, 2001,” Table 10 (February 2002).

<sup>27</sup> “Metro One: Is the Future Calling?,” *Business Week* (November 30, 2001).

<sup>28</sup> The Kelsey Group estimates ILEC/CLEC DA revenues of \$940 million and wireless revenues of \$715 million and 1.1 billion U.S. wireless DA calls and 4.9 billion U.S. wireline DA calls in the year 2000 (Kelsey Group, 2001, provided by BellSouth).

<sup>29</sup> The Pelorus Group, “Enhanced Directory Assistance: Strategies For The New Directory Assistance Landscape,” p. 8 (September 2001).

as high as 73.0 percent per year between the year 2000 and 2005.<sup>30</sup> In comparison, wireline DA volumes are likely to continue their decline.<sup>31</sup> Thus, wireless provides a readily available and rapidly expanding competitive substitute to access DA services.

### **3. The relationship between wholesale enhanced DA providers and wireless providers is likely to enhance retail wireline competition.**

According to a recent *WirelessWeek* article, enhanced DA (“EDA”) services are “expected to drive wireless subscriber growth and reduce churn.”<sup>32</sup> For example, a January 2002 press release describing the INFONXX contract to provide DA service for Verizon Wireless<sup>33</sup> noted that along with local and national directory assistance, INFONXX will provide a number of enhanced services to Verizon Wireless customers, including Spanish language directory assistance, movie listings and show times, category searches (e.g., doctors, lawyers, and florists), special event information, sports scores, reverse searches, and weather conditions. (As used herein, EDA services do not refer to enhanced services as that term is used for regulatory purposes; rather the term is used to denote services beyond basic DA services, including those that use information not available from telephone company data—e.g., movie listings and travel directions. See sections III.B.3 and III.B.4 below for a more detailed discussion.)

Natural extensions of the relationship between EDA service providers and wireless carriers are to: (1) provide the enhanced DA services to wireline customers directly as INFONXX is doing by developing its Mobile Source service; (2) promote wireless DA as a one-stop information portal that is already available with significant enhancements compared to traditional wireline DA; and (3) market the same services through existing wireline DA providers such as AT&T or others with their own DA access codes. All of these developments and new consumer choices will intensify the competition faced by ILEC DA services. Numerous substitutes for ILEC DA services are available in every state.

The characteristics of available substitutes make them, in many ways, superior to conventional ILEC DA services. For example, printed directories, CD-ROMs and Internet services provide substantial additional data and search capabilities. Options such as printed directories list businesses and government agencies by category and provide information on those entries—

---

<sup>30</sup> Frost and Sullivan data suggest the annual growth rate will average about 16.5 percent (Frost & Sullivan, “Wireless Directory Assistance Services Market, 2001-2007 6051-63” (2001)) and data from The Kelsey Group imply that the average annual growth rate will be 73 percent (The Kelsey Group, “U.S. Directory Assistance Call Volumes 2000-2005” (2001)).

<sup>31</sup> For example, Frost & Sullivan suggests an annual decline of 2.3 percent in total wireline DA volume between 2000 and 2005 (Frost & Sullivan, Wireline Directory Services Market 6050-63 (2001)).

<sup>32</sup> “Fueling A Surge In Directory Assistance,” *WirelessWeek*, p. 20 (January 21, 2002).

<sup>33</sup> INFONXX Press Release, “Verizon Wireless Chooses INFONXX for Enhanced Directory Assistance” (January 7, 2002).

e.g., they list the products or services provided. Electronic media offer even more search flexibility and business information. Finally, many of these options, such as print directories and various Internet directory services, are free. Thus, these substitutes may be perceived by customers as even more appealing than an ILEC's 411 service even if they are not precisely the same.

Their relative advantages are important to assess the desirability of various substitutes because the preponderance of DA calls (about 85 percent)<sup>34</sup> is made to obtain business telephone numbers. Use of printed directories, Internet and CD-ROM listings has a greater advantage relative to telephone DA services for obtaining business directory information because these sources offer more information that are not readily available from voice services, such as the ability to see multiple business listings by category, location details, service descriptions, and the identification of multiple branch locations.<sup>35</sup>

**a. Printed telephone directories are used extensively and constrain DA providers' ability to raise prices above competitive levels.**

Two separate surveys show that more customers use printed directories than telephonic services. A survey for Bell Atlantic demonstrated:

- 98% of respondents were aware that printed telephone directories provided listing information, compared to 90% for 411 services.<sup>36</sup>
- Printed directories have a large advantage in the "ever used" category. They lead 411 service by a margin of about 18 percentage points (94% of the respondents used printed telephone directories compared to 76% for 411).<sup>37</sup>
- When asked what method they used to obtain listing information in the past month, 83% of the respondents cited the printed telephone directories compared to only 54% for 411.<sup>38</sup> Thus, about 54 percent more respondents used printed directories than used 411 service.<sup>39</sup>

---

<sup>34</sup> The Pelorus Group, "Enhanced Directory Assistance: Strategies For The New Directory Assistance Landscape," p. 8 (September 2001).

<sup>35</sup> Frost & Sullivan, "Wireline Directory Services Market 6050-63," p. 24 (2001).

<sup>36</sup> BAMRI Market Research, "Bell Atlantic Directory Assistance Competitive Assessment," p. 5 (August 2000).

<sup>37</sup> *Id.*

<sup>38</sup> *Id.*

<sup>39</sup> (Percent of Respondents Using Printed Directories – Percent of Respondents Using DA service) / Percent of Respondents Using DA service.

- In fact, the study concluded “by almost a 2 to 1 margin, printed telephone directories are preferred over using 411.”<sup>40</sup>
- Only 39% of telephone listings are obtained from using a regular telephone vs. 45 % from printed telephone directories, 9% from the Internet, and 2% from payphones.<sup>41</sup>

Thus, the study shows that *more people use printed telephone directories* than used 411 to obtain directory listings; and that *more listings are obtained from printed directories* than from any other source. Given that 80 % of those who utilize telephone directory service are seeking local listings,<sup>42</sup> the above data (and the declining use of ILEC DA service discussed above) clearly establish that printed directories are viable competitive alternatives.

More generally, the study demonstrates that directory assistance listings are obtained by residential users from a multiplicity of sources, including printed telephone directories, other telephonic DA services, Internet services and wireless DA services. All are clear alternatives to ILEC 411 service. Indeed the data show that 411 is not the dominant source of telephone listing information.

A second study also shows that printed directories are used far more often than directory assistance. According to First Market Research’s *The Consumer Sources of Listing Information Study: A Multi Subscriber Study*:

- 5.7 times as many people rely on either local white pages or local yellow pages as their primary source to obtain directory information (i.e., an address or phone number at home);
  - That is, 40 percent of consumers rely on printed directories as their primary sources of directory information; whereas
  - Only 7 percent rely on local directory assistance as their primary source of such information.
  - The remaining 53 percent of consumers reported that they rely primarily on “personal directories” or online information.
- Respondents used white pages or yellow pages almost 5 times more frequently than they used local DA—i.e., they use

---

<sup>40</sup> *Id.*, at 83.

<sup>41</sup> *Id.* at 78. Note also that: (i) the percent of DA listings obtained from a regular telephone includes sources other than 411 listings; and (ii) wireless mobile services provide a ready substitute for wireline DA services for customers both at home and while traveling.

<sup>42</sup> *Id.*, at 83

- Local yellow pages an average of 1.5 times per week, local white pages 1.4 times per week, and
- Local DA only 0.6 times per week.

Besides the obvious price advantage, a number of other benefits contribute to the preference for printed directories. Notably the yellow pages section of the various phonebooks, like the numerous Internet service alternatives to telephonic DA service discussed below, provide types of information beyond the basic local business listing information (i.e., business name, address, and telephone number). In particular, many business yellow pages directories include information such as:

- Days/hours of operation;
- Lists of services and products;
- Years in business, licenses, accreditations, etc.;
- Alternative telephone numbers (e.g., toll free or emergency numbers);
- Rate/price information;
- Credit cards accepted;
- Web and/or e-mail address information;
- Directions to the listed business;
- Lists of other company locations and their phone numbers (this information is also available from white pages listings).

In addition, customers use the yellow pages to conduct category searches and comparisons of several business DA listings prior to calling.

**b. Internet services are available to increasing numbers of customers and offer extensive search and information options.**

Customers use Internet directories to conduct millions of searches that would otherwise be conducted through directory assistance or printed telephone directories. They have proven to be popular and reliable alternatives to telephonic DA services. For example, Verizon's SuperPages.com is free and relies on Verizon's own listings and those obtained from Axiom, a database provider.<sup>43</sup> The site receives almost 20 million searches per month, and web directories such as MSN, Excite and AOL co-brand with SuperPages.com for directory services they provide. 555-1212.com contains over 120 million residential, business and toll-free listings. This site is ranked highly as evidenced by over 1.35 million unique visitors per

---

<sup>43</sup> Axiom is a data integrator that maintains a large database that relies on ILECs and CLECs. It is updated monthly.

month<sup>44</sup> and is reported to be accurate and popular among large corporate, wireless Internet companies and residence customers.<sup>45</sup> In fact, the site charges a flat fee of \$9.95 for 100 lookups and customers are not charged for listings not found. Numerous other Internet directory sites are also available, including:

- AT&T's [www.Anywho.com](http://www.Anywho.com)
- [www.Switchboard.com](http://www.Switchboard.com)
- [www.Reach411.com](http://www.Reach411.com),
- [www.Four11.com](http://www.Four11.com)
- [www.InfoSpace.com](http://www.InfoSpace.com)
- [www.Whitepages.com](http://www.Whitepages.com)
- [www.WhoWhere.com](http://www.WhoWhere.com)
- [www.411Locate.com](http://www.411Locate.com)
- [www.PC411.com](http://www.PC411.com)
- [www.directorynet.com/infonow](http://www.directorynet.com/infonow)
- [www.DialSaver.com](http://www.DialSaver.com)
- 411 Canada, offering residential, business, and toll-free lookups for Canada
- AOL White and Yellow Pages
- BellSouth Real White Pages
- British Telecom PhoneNetUK, offering residential lookups for the United Kingdom
- CBS Switchboard
- HKT Directories, offering residential and yellow pages for Hong Kong
- Mobile Digits, providing online mobile phone and pager directory services
- Qwestdex
- Teleauskunft, offering residential and business lookups for Germany
- Telstra White and Yellow Pages, providing Australian business and residence listings

Most of these sites are free.

Further, web search engines such as AltaVista, GoTo, Excite, FindWhat, MetaCrawler, and Yahoo, all have web links to free directory assistance listing web sites.

Internet directory services are both widely available today and expected to become even more widespread in the near future. According to the National Telecommunications and Information Administration ("NTIA"), the percentage of households with Internet access increased dramatically from 26.2% in December 1998 to 41.5% in August, 2000; and to about 54% by

---

<sup>44</sup> The Pelorus Group, "Enhanced Directory Assistance: Strategies For The New Directory Assistance Landscape," p. 142 (September 2001).

<sup>45</sup> *Id.* Yahoo Internet life magazine ranked it as one of the "10 Supremely Useful Sites of 2000."

September 2001.<sup>46</sup> The NTIA also reported that the Internet is becoming more accessible to all sectors of the population—including older and lower-income people.<sup>47</sup>

This growth, as well as the proliferation of Internet directory sites and the increasing functionality of those sites, has led to growth in on line directory inquiries. According to Frost and Sullivan, the number of Internet directory searches has grown substantially in the last several years and the trend will continue.

	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>
<b>Web Visits</b>	660	809	1,014	1,326	1,793	2,543	3,649	5,185
<b>Growth</b>		22.6%	25.4%	30.7%	35.2%	41.9%	43.5%	42.1%
Estimates rounded to the nearest million. Source: Frost & Sullivan, "Invasion of Internet Directory Assistance Creates New Challenges for Telephone Directory Service Providers," p. 7 (2000).								

According to First Market Research's *The Consumer Sources of Listing Information Study: A Multi Subscriber Study* respondents report that they use online white pages or online yellow pages about as often (a total of 0.7 times per week) as they use local DA telephone service (0.6 times per week) and more than they report using national DA (about 0.3 times per week).<sup>48</sup>

<sup>46</sup> U.S. Department of Commerce National Telecommunications and Information Administration, "A NATION ONLINE: How Americans Are Expanding Their Use of the Internet," p. 1 (February 2002).

<sup>47</sup> According to the NTIA:

While notable differences remain in Internet use across income categories, Internet use has grown considerably among people who live in lower income households. Among people living in the lowest income households (less than \$15,000 annually), Internet use had increased from 9.2 percent in October 1997 to 25.0 percent in September 2001.

Internet use is growing faster among people in lower family income brackets.... Internet use among people who live in households where family income is less than \$15,000 grew at an annual rate of 25 percent between December 1998 and September 2001. Over the same period Internet use grew at an annual rate of 11 percent among people living in households where family income was \$75,000 or more.

U.S. Department of Commerce National Telecommunications and Information Administration, "A NATION ONLINE: How Americans Are Expanding Their Use of the Internet," pp. 11-12 (February 2002).

<sup>48</sup> First Market Research, "The Consumer Sources of Listing Information Study: A Multi Subscriber Study," p. 18 (October 2000).

This finding is consistent with Frost & Sullivan's study that reports that Internet directory web sites were expected to receive over 1 billion visits per year in 2001.<sup>49</sup> Further, as shown in the above table, Internet directory usage is expected to grow at an average rate of 34% per year through 2006. As a result, the Internet may be used over 5 billion times per year for directory assistance information by 2006 and will exceed the use of wireline telephonic DA.

The strong growth is plausible because most services are inexpensive or free and highly informative—allowing numerous types of searches and providing a tremendous variety of data about residential locations and businesses. In addition to listings of customers' names, addresses, and telephone numbers, most Internet directory web sites provide numerous features not available from telephonic or printed DA. For example, Internet yellow pages DA websites provide:

- The ability to search and receive information in the requestor's native language;
- Dynamic multiple category searches by local or national type of business/geographic area (e.g., all electricians within a five mile radius of the requestor's home);
- Local and national maps and driving directions to the requested listing;
- Local and national web site and e-mail address of the business requested;
- Local and national criss-cross searches, or the ability to search for all or specified businesses in a user-specified geographic area;
- Ability to dynamically add/change/delete business listing information available at the Internet Yellow pages website;
- Local and national "hot links" to related web sites based upon requested information (e.g., a requestor looking for auto dealers, in addition to receiving name, address, and telephone listing information, will see related links to general automotive topics, consumer buying guides, classified ads and so forth).

Internet white pages sites similarly provide end-users with numerous value-added features not available from other sources, such as:

- Direct local and national "hot links" to send a requested product or service (e.g., a greeting card, invitation, postcard, flowers, gift certificates, and other assorted gifts from a variety of "hot linked" merchandise providers);
- Local and national web sites, e-mail addresses, cell phones and facsimile phone numbers of the persons requested;

---

<sup>49</sup> Frost & Sullivan, "Invasion of Internet Directory Assistance Creates New Challenges for Telephone Directory Service Providers," p. 7 (2000).

- The ability to find a requested person's neighbors;
- Local and national "hot links" to related web sites (e.g., classmate alma mater web sites).

c. **CD-ROMs also offer detailed information capabilities.**

CD-ROM-based directory services products provide capabilities like those of Internet directory sites. Directory data on CD-ROMs provide powerful and convenient alternatives for obtaining data beyond the capacity of telephone books or from telephonic DA services. Most CD-ROM directories offer some or all of the following local *and national* information:

- A business or individual name and full address;
- Corresponding Metropolitan Statistical Area ("MSA");
- County;
- Phone number;
- Toll-free number;
- Facsimile number;
- Business heading and Standardized Industrial Code ("SIC");
- Longitude and latitude.

Most CD-ROM directories include the ability to export information to a spreadsheet program and allow searches by one or more of the following categories:

- Business specialty;
- Business or individual name;
- Full address;
- Street name;
- House number;
- Radius;
- City;
- Metropolitan Statistical Area ("MSA");
- County;
- State;
- ZIP Code;
- Phone number;
- Toll-free number;
- Facsimile number;
- Business heading and standardized industrial code ("SIC"); and
- Longitude and/or latitude.

They also allow the user to initiate a call and to connect to the requested business or residence listing. Companies marketing white and yellow page phonebooks on CD-ROM include InfoUSA and Acxiom.<sup>50</sup>

#### **4. Independent Wholesale DA Providers Have Grown Significantly in Number and Market Presence.**

As noted at the outset of Section III, wholesale DA service competition and ease of entry are important because they facilitate competition for retail DA services to end users. In addition, as explained in Section III.C, the existence of competition for wholesale DA services promotes competition for retail local services provided by CLECs. Further, as discussed below, the lines between wholesale DA providers and retail providers have been blurred as wholesale DA providers already serve end users and have begun to expand to provide new retail services.

The firms currently providing wholesale DA services include those that compile and continuously update nationwide databases of telephone numbers and firms that have developed their own sophisticated DA platforms and call centers. The latter firms provide wholesale DA services that are then resold by major firms including AT&T, Verizon, and various wireless companies. They also offer retail DA services to business customers under contract often with discounts for high volumes. These business customers can also use customer premises equipment that translate (effectively “speed dial”) a preferred DA number pattern to an 800 number to route DA requests directly to the independent DA provider.<sup>51</sup> These independent firms offer enhanced DA (EDA) services that expand DA to include information beyond that which can be derived from telephone number databases.

A number of companies provide wholesale directory assistance services. Two of the largest and best known are Metro One Telecommunications, Inc. (MetroOne) and INFONXX. Others include McLeod, Excell, Telegate and eData.com.

Metro One is a publicly traded company that operates call centers in 29 cities throughout the United States. According to published reports, Metro One handled approximately 472 million requests for information in 2001, up 56% from approximately 302 million requests in 2000; and about 3.3 times as many as the 142 million for 1999.<sup>52</sup> Metro One has recently been included in Fortune’s comprehensive annual list of America’s 100 Fastest-Growing Companies. According to its year 2000 10-K filed with the Securities and Exchange

---

<sup>50</sup>infoUSA.com Press Release, “Business Database Competitive Audit August, 2001,” [http://list.infousa.com/cgi-bin/abici/abici.pl?bas\\_session=S83601709816445&bas\\_elements=4&bas\\_vendor=0&bas\\_type=LC&bas\\_page=999&bas\\_action=CompetitiveAudit](http://list.infousa.com/cgi-bin/abici/abici.pl?bas_session=S83601709816445&bas_elements=4&bas_vendor=0&bas_type=LC&bas_page=999&bas_action=CompetitiveAudit) (March 18, 2002).

<sup>51</sup> For example, see INFONXX InfoSave (<http://www.infonxx.com/corpplus.html>, accessed March 27, 2002) and Telegate USA’s Dedicated DA (<http://www.telegateusa.com/Eng/EnhancedDA.htm>, accessed March 27, 2002).

<sup>52</sup> Metro One Press Release, “Metro One Generates Revenue and Earnings for Fourth Quarter and 2001 Year” (February 7, 2002); Metro One Press Release, “Metro One Telecommunications Reports Record Fourth Quarter Revenue of \$47.7 Million; Record EPS of \$0.38” (February 6, 2001).

Commission, Metro One's revenues and net income have increased more than 800% since 1996, and its growth appears unabated. Fourth quarter 2001 revenues increased 32% over the prior year.<sup>53</sup> It provides directory assistance services to AT&T Wireless and Sprint Wireless, among others.

INFONXX has also built a nationwide network with four major call centers and points of presence throughout the United States.<sup>54</sup> INFONXX provides directory assistance services for wireless carriers, including Verizon Wireless, as well as banks, universities, brokerage houses and other businesses. INFONXX has also posted 800 percent revenue growth between 1995 and 1999 and employs more than 2,500 people. It was recently recognized by Inc. Magazine as one of the fastest growing private companies in the United States.

Telegate has been providing specialized local and national directory information services to European telecommunications firms since early 1995. The firm entered the U.S. market in July 2000 with the acquisition of CFW's directory assistance business.<sup>55</sup> Telegate reportedly now operates three call centers with over 370 operators and has built two additional centers in the United States scheduled for operation in the future.<sup>56</sup> It offers local and national DA operator service with an advertised accuracy rate of 95 percent,<sup>57</sup> "Dedicated DA" service that permits customers to purchase directory assistance on a time rather than per-call basis,<sup>58</sup> and "Direct Connect" computerized direct access to the LSSi DA database for high volume customers.<sup>59</sup> The company has also announced a targeted launch of enhanced DA service that provides weather information, navigation services, traffic reports, sports scores, stock, movie, and local cultural event information, as well as business category searches.<sup>60</sup> It processed 35.7 million US calls in 2001, a 48% increase in volume compared to the previous year, and replaced one of the call centers it acquired from CFW with a new bilingual-capable call center in San Bernardino, CA.<sup>61</sup>

Further, the growth of these firms has clearly come at the expense of the major ILECs. By 1999, the major ILECs' *collective* share was just over 50 percent of nationwide wholesale DA

---

<sup>53</sup> *Id.*

<sup>54</sup> InfoNXX Locations/Network. <http://www.infonxx.com/locations.html> (accessed April 1, 2002).

<sup>55</sup> nTelos Press Release, "CFW Communications Finalizes Sale of Directory Assistance Operations to telegate AG" (July 12, 2000).

<sup>56</sup> See <http://www.telegateusa.com/Eng/FAQS.htm> (accessed March 19, 2002).

<sup>57</sup> See <http://www.telegateusa.com/Eng/DirectoryAssistance.htm> (accessed March 19, 2002).

<sup>58</sup> See <http://www.telegateusa.com/Eng/EnhancedDA.htm> (accessed March 19, 2002).

<sup>59</sup> See <http://www.telegateusa.com/Eng/DirectConnect.htm> (accessed March 19, 2002).

<sup>60</sup> See <http://www.telegateusa.com/Eng/EnhancedServices.htm> (accessed March 19, 2002).

<sup>61</sup> Telegate Annual Report, "The Power of Voice: Annual Report 2001," p. 22.

revenues according to a recent estimate; and according to this same study, alternative providers appear to have had comparably large individual shares.<sup>62</sup>

## **5. The growth of competition has been associated with steep declines in ILEC DA volumes.**

### **a. Major ILEC DA volumes have been declining**

Declining volumes of an incumbent provide one measure of growing competition, assuming that the market as a whole is growing. According to this measure, the competition faced by the ILECs is very vigorous. As shown by the data below, the major ILECs have experienced dramatic losses of both retail and wholesale DA call volumes. First, as shown in the following table, over the period from 1996 to 2001, the major ILECs have lost a cumulative total of 2.2 billion DA calls or 43 percent of the 1996 total.<sup>63</sup> This occurred while switched local access lines served by these ILECs grew by 12 percent between 1996 and 2000, although the number declined from 1999 to 2001.<sup>64</sup> Furthermore, despite the fact that the major ILECs have recently lost end-user lines and even though total wireline carriers lost switched access lines according to the most recent FCC data, it is reasonable to assume that demand for DA inquiries has been growing because total (ILEC + CLEC) telephone lines increased over the entire 1996 to 2001 period. For example, if we assume that DA inquiries have been growing proportionately with the number of total access lines and that the ILECs would have retained the share of the lines and DA calls that they started with in 1997, (i.e., the level of competition has remained constant) then we would expect the ILEC DA services to have handled about 86 percent more DA calls than they actually carried in 2001.<sup>65</sup> The fact that ILEC DA services have not handled 86 percent more calls implies that there are many competitive alternatives available to consumers.

---

<sup>62</sup> Frost & Sullivan, U.S. Wholesale Directory Assistance Services Market 6046-63, p 14 (2000). According to this study, Excell was the largest single wholesale DA provider in 1999 with almost 18 percent of revenues, followed by Verizon, and SBC with about 17 percent each and INFONXX with about 11 percent. BellSouth and Metro One had 7.8 and 7.5 percent respectively; and SNET had about 6.5 percent.

<sup>63</sup> DA wireline volume data obtained from BellSouth, SBC, Qwest, and Verizon.

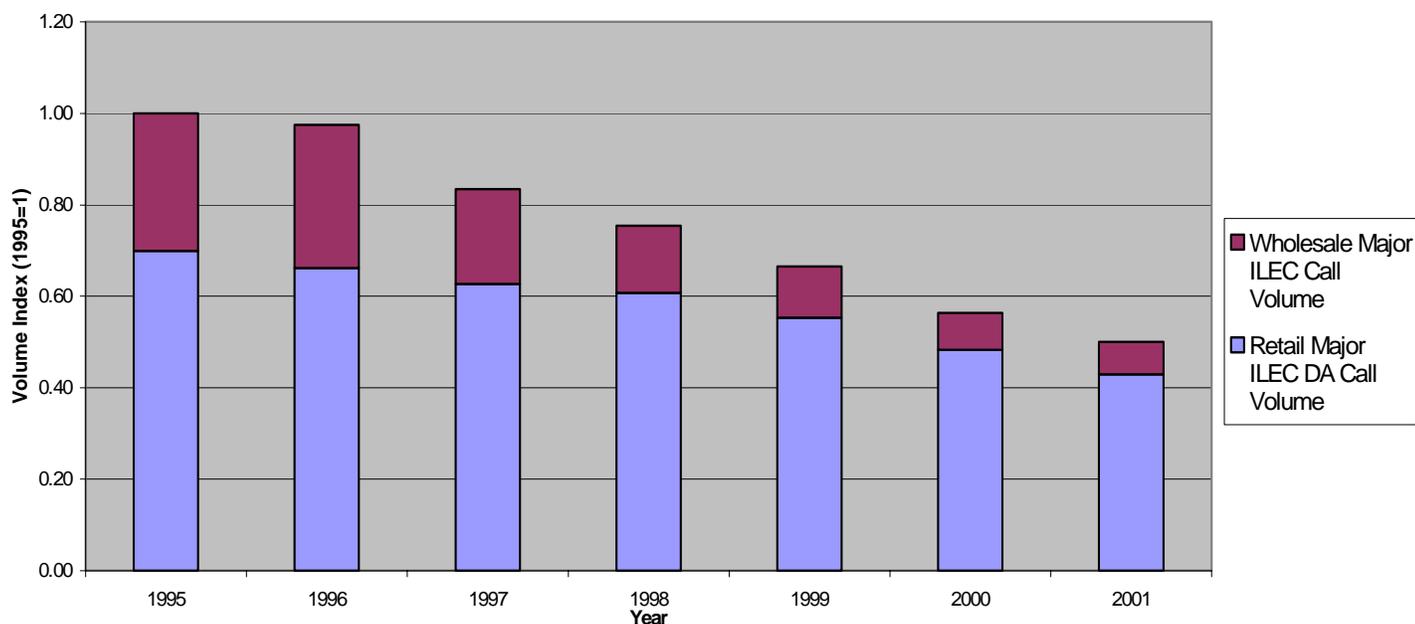
<sup>64</sup> Major ILEC switched access lines obtained from the FCC's ARMIS report for 1996 – 2000; and from Federal Communications Commission CCB Industry Analysis Division, "Local Telephone Competition: Status as of June 30, 2001," Table 1 (June 30, 2001) for 2001.

<sup>65</sup> Major ILECs reported 4.6 billion total (retail + wholesale) DA calls in 1997 and 159,141,000 switched access lines, including lines supplied to CLECs on a resale or UNE basis. If the major ILEC DA calls grew 20.5 percent in proportion to the growth in total access lines reported between December 1997 and June 2001, major ILECs would have reported 5.5 billion DA calls in 2001, or 86 percent greater calls than the roughly 3 billion total (retail + wholesale) DA calls that were actually reported.

<b>Table 4: Major ILEC Retail and Wholesale DA Volumes Have Been Declining.</b>		
	<b>Total DA Volume</b>	<b>Decline</b>
<b>1996</b>	5,235,627,982	
<b>1997</b>	4,579,660,406	12.5%
<b>1998</b>	4,138,615,884	9.6
<b>1999</b>	3,820,326,001	7.7
<b>2000</b>	3,296,425,345	13.7
<b>2001</b>	2,960,980,606	10.2
<b>Cumulative Decline</b>	<b>(2,274,647,376)</b>	<b>(43.4%)</b>
<b>Sources:</b> BellSouth, SBC, Qwest and Verizon. SBC was not able to provide wholesale DA volumes. NERA estimated SBC's wholesale volumes based on retail and wholesale DA data provided by BellSouth and Qwest.		

Data from Qwest and BellSouth show that the decline has occurred since at least 1995 and that the decline has been in *both retail and wholesale* DA volumes.

Data from Two Major ILECs Confirm a Precipitous Decline in Both Retail and Wholesale DA Volumes



Source: BellSouth and Qwest data.

**b. The decline in traditional LEC DA Manifests Losses Due to Competition.**

These data, coupled with the data in the previous sections showing the rapid growth of competitors, clearly establish that the losses are indicative of increasing competition for both wholesale and retail DA services. The NPRM at ¶18 asks “...whether any such decline in wireline DA call volume could be due to other factors such as declining quality of service or the growth of wireless or Internet-based services.” It is important for the Commission to recognize that the portion of the decline attributable to growth of wireless or Internet based services reflects competition, not “other factors,” since these are substitutes for wireline DA services. There appears to be no evidence indicating that service quality of ILEC DA has declined or that declines in wireline DA call volumes are attributable to any decline in service quality. To the contrary, the major ILECs continue to provide high quality service today and are regulated by state authorities to satisfy a number of service benchmarks. For instance, BellSouth and Verizon report 95 percent or better DA request fulfillment rates; third party

research indicates that Qwest similarly has a 90 percent or better fulfillment rate.<sup>66</sup> Regularly conducted audits of the major ILECs' databases consistently report at least 95 percent accuracy rates.<sup>67</sup> Surveillance by state commissions and competition ensure that the major ILECs provide high quality DA service.

Thus, the continuing pattern of decline in ILEC DA call volumes reflects a number of strong marketplace trends, including: (1) the substitution of wireless DA services for wireline DA services, as wireless services have captured an expanding number of customers and have become increasingly viable substitutes for a rapidly growing number of customers; (2) the rapid development of local and toll competition; (3) the strong growth of the Internet; (4) the growing availability of Internet directory sites, and (5) the shift from dial-up to broadband Internet access. Several of these trends are reflected in recent reports that wireline telephone subscription has actually declined over the last year as consumers have moved to wireless and broadband options.<sup>68</sup>

Wireline competition comes principally from CLECs and IXC's (in many cases the two overlap) but also includes independent DA providers and Internet service providers that are introducing and expanding new retail telephonic services. They have captured a growing share of the local exchange and intraLATA toll markets.<sup>69</sup> Although we do not have detailed data on CLEC DA volumes, it is reasonable to assume that their share of retail DA has increased proportionally as their share of the local wireline service market has increased. In addition, it is reasonable to believe that the IXC's have captured a growing share of local and regional DA calling volumes. According to Frost and Sullivan, by 1999, the major ILECs retained about 75% of local wireline DA calling volume;<sup>70</sup> however, since then competitors have more than doubled their share of local lines from about 4.4 percent or 8.3 million lines at year end 1999 to about 9 percent or 17 million lines in mid 2001.<sup>71</sup> (Of the lines served by CLECs, about 8 million or

---

<sup>66</sup> Ex Parte Presentation of BellSouth, SBC, Qwest, and Verizon, p. 4 (December 14, 2000).

<sup>67</sup> *Id.*

<sup>68</sup> The Wall Street Journal reported that consumers have pulled the plug on almost 2.5 million access lines in the second and third quarters of 2001 alone and replaced these lines with wireless phones or broadband Internet access. See Shawn Young, "Callers Cut Off Second Phone Lines For Cellphones and Cable Modems," Wall Street Journal (November 15, 2001).

<sup>69</sup> CLECs reported 17.3 million lines in service at the end of June 2001, or 9% of all U.S. switched access lines in service. In contrast, CLECs reported 14.9 million lines, or 7.7% of all lines at the end of 2000. See Federal Communications Commission Press Release, "Federal Communications Commission Releases Data on Local Telephone Competition" (February 27, 2002).

ILECs reported \$11.3 billion in toll revenues in 1995 and only \$6.6 billion in 2000, a 41.7% decline. See Federal Communications Commission CCB Industry Analysis Division, "Trends in Telephone Service" (August 2001).

<sup>70</sup> Frost & Sullivan, "Market Engineering Research for the U.S. Wireline Directory Assistance Services Market 1996-2006 6044-63," p. 48 (2000).

<sup>71</sup> Federal Communications Commission CCB Industry Analysis Division, "Local Telephone Competition: Status as of June 30, 2001," Table 1 (June 30, 2001).

almost half of the 17 million were served via their own switches, including at least 5 million with their own local loops and another 3.2 million with UNE loops.)<sup>72</sup>

Other factors driving the decline in major ILEC DA volumes include the emergence of new IXC DA services offering national and local DA listings and efforts by the IXCs to promote and enhance their DA options. Economic theory also suggests that ILEC local DA volumes may have declined in some states in response to recent regulatory decisions that have allowed DA rates to rise to more competitive levels as calling allowances have been reduced or eliminated and state regulators have approved increased charges for DA calls. This factor would make free options such as Internet directory sites and printed directories relatively more attractive. Note however, that substantial declines in ILEC calling volumes have also occurred in states that have maintained DA rates below cost.<sup>73</sup>

The following chart summarizes the impact of several of these trends for 1997 – 2001. The chart shows that the dramatic decline in major ILEC DA volumes associated with the loss of retail lines to CLECs and other competitors—including AT&T and WorldCom who provide bundles of local and toll services to both business and residence customers—as well as losses to IXCs who compete for intraLATA toll customers and for 1010 equal access dialing DA calls. It also shows that the Internet and wireless options have captured a growing share of total directory inquiries. Unfortunately, we did not find comparable data on the trends in usage of printed directories, CD-ROM directories or independent DA providers. Nor do we have data on the volumes of the independent ILECs.<sup>74</sup>

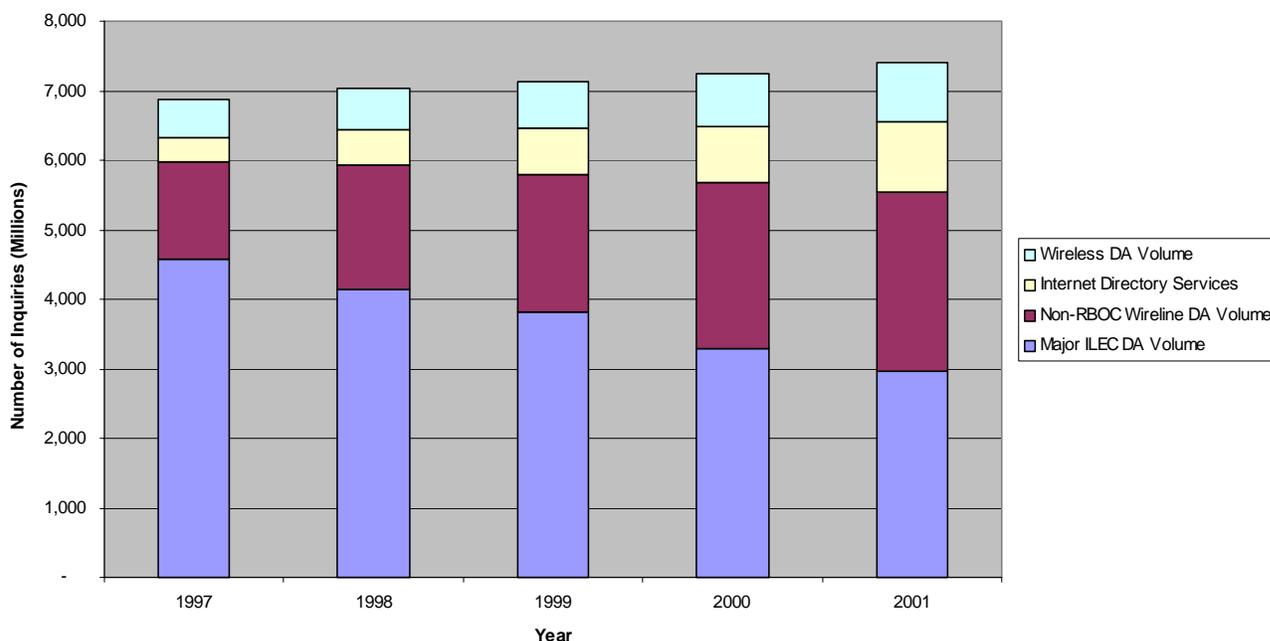
---

<sup>72</sup> Federal Communications Commission CCB Industry Analysis Division, “Local Telephone Competition: Status as of June 30, 2001” Table 3 (June 30, 2001).

<sup>73</sup> Source: SBC Communications.

<sup>74</sup> However, the smaller ILECs accounted for only about 8 percent of total ILEC access lines, thus, the pattern of decline for all ILECs would be similar, although potentially less pronounced if the smaller companies have experienced less competition from CLECs. Source: Federal Communications Commission Common Carrier Bureau ARMIS Report (2000).

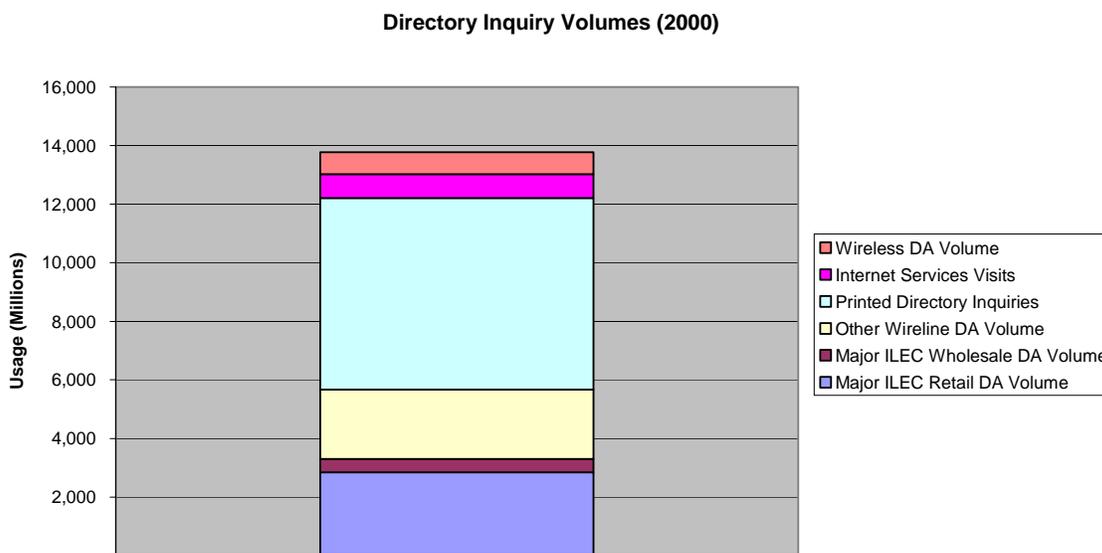
Total Non-Printed Directory Assistance Market Volume



**Sources & Notes:** Major ILEC DA total (retail + wholesale) volumes provided by BellSouth, SBC, Qwest and Verizon. SBC did not provide wholesale volume data; its wholesale volumes were estimated based on data provided by Qwest and BellSouth. 1997 and 1998 web visit data estimated by NERA. Non-RBOC Wireline DA volume calculated from Frost & Sullivan's estimate of total wireline DA volumes. Frost & Sullivan, "Wireline Directory Services Market 6050-63" (2001); Frost & Sullivan, "Invasion of Internet Directory Assistance Creates New Challenges for Telephone Directory Service Providers" (2000); Frost & Sullivan, "Wireless Directory Assistance Services Market 2001-2007" (2001).

Note that the above chart overstates the share of total DA inquiries accounted for by the major ILECs' telephone DA service because it excludes substitutes such as printed directories and CD-ROMs. For example, using data available for 2000 allows us to include an estimate of residential printed directory usage. Doing so, we find that the share of total DA inquiries accounted for by the major ILEC DA services came to no more than about 24 percent of the total.<sup>75</sup>

<sup>75</sup> The major ILECs report approximately 3.3 billion total DA calls in 2000 out of an estimated 13.8 billion total DA inquiries made from all sources. SBC's wholesale DA volume was estimated. See below for a detailed explanation of NERA's analytical methodology.



**Notes:** Wireless DA volume and Internet services visits obtained from Frost & Sullivan. Printed directory usage estimated from Frost & Sullivan's total wireline DA volume figure for 2000 and Bell Atlantic directory assistance survey. 45% of Bell Atlantic survey respondents' directory inquiries were obtained from printed directories and 39% were obtained from DA calls. Based on this ratio and Frost & Sullivan's estimate of 5.7 billion DA calls, we estimated that 6.5 billion directory inquiries were placed with printed directories in 2000. Other wireline DA volume consists of the difference between Frost & Sullivan's estimate of total wireline DA volume and the DA volume data provided by the major ILECs. SBC's wholesale DA volume was estimated from wholesale and retail DA volumes provided by BellSouth and Qwest. Note also that other market research reports, e.g., a Kelsey Group report for SBC, shows higher shares for print directories than shown in this chart.<sup>76</sup>

**Sources:** Frost & Sullivan, "Wireless Directory Assistance Services Market, 2001-2007 6051-63" (2001); Frost & Sullivan, "Invasion of Internet Directory Assistance Creates New Challenges for Telephone Directory Service Providers" (2000); Frost & Sullivan, "Market Engineering Research for the U.S. Wireline Directory Assistance Services Market 1996-2006" (2000); DA volume data provided by BellSouth, SBC, Qwest and Verizon.

## 6. The market is nationwide.

Producers are part of the relevant geographic market if they produce substitutes consumers may turn to in response to a price increase by providers in the area where the service is used. For example, a car wash in New York may be just as good as one in Atlanta, but Atlanta consumers would not go to the New York carwash because the costs of driving to New York would be too high. In contrast, DA providers serving Atlanta compete with providers of directory assistance service located virtually anywhere in the U.S. This is the case because DA providers with calling centers located any place in the country (or perhaps in other countries) can readily serve customers located throughout the US and because Internet providers anyplace in the world can

<sup>76</sup> The Kelsey Group, "A Universe of over 40 Billion References in the U.S. Market," (March 2002).

compete to serve every customer with Internet access. For example, INFONXX announced plans in September 2001 for a new \$3 million calling center in the Philippines to be opened by December of the same year. The 200- to 300-seat call center is capable of handling up to 5 million DA calls per month from customers around the world.<sup>77</sup>

Thus, ILEC DA services compete with IXC, CLEC, independent DA providers and Internet directory services that offer nationwide listings.<sup>78</sup> The fact that ILEC DA services are generally purchased by customers in their own service area is not important. Producers provide nationwide listings accessible to users anyplace in the country. Therefore, competition takes place in a nationwide market in which ILEC DA providers face competition from national providers.

### C. There are no substantive barriers to entry.

To assess “Competition in the Retail DA Market,” the Commission seeks comments on entry barriers and the current extent of competition in this market. (See NPRM, ¶¶14 – 15) In particular, the Commission seeks comment on “whether the current level of competition in the DA market indicates that ILEC control over the 411 dialing code is not, in fact, a barrier to competition.”<sup>79</sup> (NPRM, ¶14)

The evidence described above shows the directory assistance (DA) services market is competitive; thus, the 411 dialing code is not a barrier to entry. The presence and expansion of competitors, the availability of substitutes, and the substantial erosion of ILEC DA calling volumes at a time when total local (ILEC + CLEC) lines and network usage have been growing demonstrate that there are no substantive barriers to entry.<sup>80</sup>

Further, as shown below:

- Regulatory protections and market pressure ensure that competitors have non-discriminatory access to directory listing data.
- The need to purchase other inputs—e.g., labor, computers and other calling center investments—has not deterred entry. These components are readily available in the

<sup>77</sup> CallCentres.Net, “US directory assistance center chooses the Philippines,” <http://callcentres.net> (September 3, 2001). See also: Gil C. Cabacungan Jr., “US firm picks RP as call center site,” *Philippine Daily Inquirer* (August 30, 2001).

<sup>78</sup> Major ILECs offer nationwide retail directory assistance service to their customers. To do so they must purchase listing information from third parties for coverage outside of their home regions.

<sup>79</sup> The NPRM (at ¶14) also seeks comments: “on the current extent of competition in this market and whether the ILEC monopoly over the 411 dialing code for DA is an unreasonable barrier to competitors who wish to enter the market.”

<sup>80</sup> As noted above, the ILEC share of lines has decreased markedly in the last few years and the number of ILEC end-user lines have decreased as well.

marketplace and LECs enjoy no special advantage in their acquisition. There is ample evidence that many wholesale operator centers exist and that more can be built within a time frame. The ease of entry and availability of alternative suppliers therefore effectively constrain the ILECs' retail DA service prices by providing a means for other competitors to provide DA services. This is confirmed by the recent FCC finding that the ILECs should not be required to provide these services as unbundled network elements.<sup>81</sup>

- Thus, companies desiring to provide retail DA services can enter rapidly either by self-provisioning or purchasing wholesale services from a number of providers.

To further substantiate that there are no substantive barriers to entry, we describe below the data and analyses showing that (1) access to DA databases is not a barrier to entry, and ILECs cannot exercise market power via their alleged control over that database; (2) the 411 code is not an essential input to the production of directory assistance services; and (3) firms have been able to rapidly assemble the inputs needed to provide DA services.

### **1. The database is not a barrier to entry**

Regulatory requirements and market conditions ensure that access to ILEC DA databases is not a barrier to entry. The DA database must be made available by the ILECs at nondiscriminatory rates, terms, and conditions. At least three firms are currently purchasing the DA database from an ILEC for every state they serve.<sup>82</sup> Further, numerous wholesale vendors already have built databases that they offer to CLECs, ILECs, IXCs, Internet providers, and wireless carriers.

In accordance with the requirement of the 1996 Act, as further clarified by the FCC,<sup>83</sup> ILECs must provide competitors with nondiscriminatory access to their local DA databases to any DA provider that wishes to purchase it on a nondiscriminatory and reasonable basis, in accordance with the FCC's implementing regulation 47 C.F.R. § 51.217(c)(3):

... that local exchange carriers (LECs) must provide competing directory assistance (DA) providers that qualify under section 251(b)(3) of ... the Act ... with nondiscriminatory access to the LECs' local directory assistance databases, and must do so at nondiscriminatory and reasonable rates.<sup>84</sup>

---

<sup>81</sup> Provision of Directory Listing Information under the Telecommunications Act of 1934, As Amended, CC-Docket No. 99-273, First Report and Order (Rel. January 23, 2001) ("Directory Listing Order"), ¶ 9.

<sup>82</sup> Source: BellSouth, SBC, Qwest, and Verizon operator services data.

<sup>83</sup> Provision of Directory Listing Information Under the Telecommunications Act of 1934, As Amended, CC Docket No. 99-273, FCC 01-27, First Report and Order (rel. January 23, 2001) ("Directory Listings Order"), ¶ 10.

<sup>84</sup> Directory Listing Order, *supra*, ¶ 1.

Thus, all subscribers to ILEC local DA databases can offer their customers listing information at the *same* level of accuracy, timeliness and comprehensiveness that ILEC customers receive when requesting name, address, and telephone number information.

Further, subscribers to ILEC databases may provide database access to DA providers. ILECs also give database purchasers substantial flexibility in choosing an economic means of acquiring the DA data—i.e., they provide their databases by electronic query or via bulk transfer on magnetic tapes. Customers who elect bulk transfer may also obtain *daily* updates of the listing information via a data circuit. Electronic query is also available either over the public data network or via direct link into the ILEC's database.

Comprehensive sources of DA listings are also available from a number of ILEC competitors. For example, Excell promotes its product as “one of the most accurate nationwide databases in the industry,” and states it continuously updates and verifies its DA listing information. Excell obtains its DA listing information from an independent third party database provider and employs the services of an independent auditing firm, The Paisley Group, LTD to ensure customer fulfillment and data accuracy.<sup>85</sup> Other DA databases include those from Axiom ([www.axiom.com](http://www.axiom.com)), which is comprised of 160 million residential and 12 million business listings and has direct connections to ILEC and LEC databases; and LSSi, which provides a national database, used by Telegate<sup>86</sup> and others.

## **2. LEC “control of 411” does not constitute a barrier to entry.**

In this section, we respond to the FCC's request for comments “on whether LEC control of 411 serves as a barrier to entry by independent DA providers to the retail DA market because 411 is easy to use and is well-established and recognized as the abbreviated dialing code that customers have associated for years with DA service.” (NPRM at 15) First, this question may be somewhat too narrowly drawn because it focuses only on traditional wireline LEC DA, but as has been shown, “the retail DA market” is in reality much broader, including IXC and toll DA, wireless DA and other competing substitutes from which consumers may choose. In any event, the evidence shows that telecom and non-telecom independent DA providers can compete effectively against ILEC DA services without using the 411 code.

The 411 code is not an essential element of either telecom or non-telecom directory assistance services. Major competitors can and currently do provide DA services to ILEC customers without relying on the 411 access code. While AT&T heavily advertised “00 Info”, both Sprint & Worldcom have the same service. For telecom services, AT&T, Sprint and WorldCom presubscribed customers can dial “00” to reach those IXCs' respective DA services offering local or non-local listings anywhere in the country. Obviously, the two digit “00 code,” advertised as “00 Info” in the case of AT&T, is no more difficult to dial or remember than 411

<sup>85</sup> The Pelorus Group, “Enhanced Directory Assistance – Strategies for the New Directory Assistance Landscape,” p. 119 (September 2001).

<sup>86</sup> Telegate USA, “Frequently Asked Questions,” <http://www.telegateusa.com/Eng/FAQS.htm> (accessed March 27, 2002).

and is arguably easier to remember than 411. These three major IXCs are estimated to retain a substantial majority of presubscribed customers. Therefore, the vast majority of consumers, including ILEC customers, can already obtain telephonic DA by dialing a brief number other than 411. Other IXCs also may and can also offer competing DA services in a similar manner.

Any customer that is not presubscribed can dial these same “00” DA services by dialing that carrier’s 1010 code. There are also a variety of other 10-10 numbers including Worldcom’s 10101-9000, which it promotes as the “[t]he easy way to find a phone number. Anywhere in the country!”<sup>87</sup> IXC customers can also readily dial 1+ area code and 555-1212—to obtain directory assistance from their presubscribed carriers. IXCs as well as other DA providers can and do use toll free (i.e., “800”) numbers. For example, AT&T’s DA service—as well as its calling card and operator assistance services—can be reached by dialing 1-800-CALL-ATT. InfoNXX uses 800 numbers to serve its corporate retail DA clients, and as described above INFONXX is evidently developing an enhanced retail DA service that uses a 555 XXXX code. (See Section III.A.) “Independent” DA providers, like Telegate can therefore readily provide competing DA services using numbers other than 411.

In addition, both experience and technology—coupled with the evidence of alternative DA providers and how they are accessed—refute the claimed need for access to the 411 code to provide DA service:

- Toll free ten digit numbers are widely used for numerous sources of information—from hotel reservations to customer service for every conceivable product and service. Yahoo by Phone, AOL by Phone and Tell Me are examples of services providing a variety of information to their customers through 800 numbers. And, numerous long distance carriers use toll free numbers to provide calling card services—some of which include DA services.<sup>88</sup> Thus, both consumers and businesses are quite accustomed to using toll free numbers to access telecommunications information services.
- It is noteworthy that for toll calling, many firms’ efforts to compete using their own access codes or via toll free access numbers—without presubscription—have been very successful. For example, MCI and AT&T instituted their own “dial around” toll services to appeal to occasional users—e.g., MCI’s 1010 321 and 1010 220 and AT&T’s Lucky Dog service, now marketed as 10-10-345 service. Both MCI and AT&T introduced these services in 1998 and marketed them heavily. These types of services continue to be marketed today, even though toll presubscription is now required. This is significant because it provides another example of how new services using new number codes were able to thrive in the telecommunications marketplace.
- Technology advances enable customers to control how they want to dial or access a particular provider, including speed dialing on residence telephones and programmable PBXs and key sets for businesses as well as, personal digital assistants (“PDA”) personal directories. These allow abbreviated dialing, even one-button access to reach

<sup>87</sup> 10-10-9000. <http://www.10109000.com> (March 29, 2002).

<sup>88</sup> For example, AT&T’s 1-800-CALL-ATT service and Sprint’s 1-800-2-SPRINT offer DA. Source: calls to AT&T and Sprint (March 15, 2002).

any telephonic DA provider preferred by a residential or business customer. Voice recognition features also enable customers to program their phone to dial a particular DA provider simply by stating “DA” or “directory assistance.”

- Furthermore, not having 411 has obviously not deterred competition via electronic options—i.e., Internet service directories, and CD-ROM directories.

Thus, from an economic perspective, use of the 411 code is neither a barrier to entry nor an essential element because both wireline telephone DA providers and other competitive substitutes do not have to use that code to compete with traditional DA services.

Additionally, state commissions or legislatures around the country have evidently found that there was sufficient competition within their states, without “411 presubscription” or other changes in dialing codes to reclassify ILEC DA services as competitive or deregulate local DA services using the 411 code.<sup>89</sup>

Finally, over 132 million<sup>90</sup> wireless subscribers can use their wireless mobile phones to obtain DA services.

In summary, as illustrated by recent competitive entry in the DA market, use of access numbers other than 411 has clearly not proven to be an entry barrier; ILECs do not even fully control access to the number; and, to the extent they do, that control has certainly not prevented the development of competition for DA services.

### **3. Ease of entry is confirmed by the growth and expansion of wholesale DA providers, the national scope of the market, and analysis of entry conditions.**

Experience shows that firms can rapidly enter and expand to provide DA services using their own facilities. This is the best evidence that there are no substantive entry barriers and is demonstrated by the evidence of entry discussed above.

---

<sup>89</sup> See exhibit 1. See also Arizona Corporation Commission, Docket No. T-01051B-99-0362, Decision No. 62129 (December 14, 1999); Iowa Utilities Board, Docket Nos. INU-00-3, WRU-99-8-272, and WRU-00-88-272, 2001 WL 306247 (February 23, 2001); Public Service Commission of Delaware, PSC Docket No. 99-030T, Order No. 5330 (January 12, 2000); Public Service Commission of West Virginia, Order, Case Nos. 00-0318-T-GI, 00-0705-T-PC, 01-0364-T-PC, and 01-0482-T-P (October 3, 2001) adopting *Joint Stipulation and Agreement for Settlement*, filed August 9, 2001, by Verizon West Virginia, Inc., The Consumer Advocate Division, and Commission Staff; Rhode Island and Plantations Public Utilities Commission, Docket Nos. 2913 and 2914, Settlement Agreement (June 13, 2000); South Dakota Public Service Commission, TC99-098, 1999 S.D. PUC LEXIS 205 (December 8, 1999); Utah Public Service Commission, Docket No. 99-049-10, 1999 Utah PUC LEXIS 221 (October 19, 1999); Washington Utilities and Transportation Commission, Docket UT-990259, 1999 Wash. UTC LEXIS 346 (April 29, 1999); Colo. Rev. Stat. § 40-15-401 (2001).]

<sup>90</sup> See Cellular Telecommunications & Internet Association, <http://www.wow-com.com> (March 15, 2002).

To compete for DA services accessed via the telephone, competitors can: (i) self-provide directory assistance services; (ii) purchase directory assistance services from a wholesale provider to combine with their own equipment and operators; or (iii) resell ILEC local DA services. As discussed below, there are no prohibitively high barriers to impede entry using any of these alternatives.

In addition, the FCC concluded that incumbent LECs need not provide access to their directory assistance-related services as unbundled network elements because “competition in the provision of operator services and directory assistance has existed since divestiture.”<sup>91</sup> The FCC also concluded that: “... a variety of alternative providers of OS/DA offer services at comparable cost and quality” to those of the incumbents.<sup>92</sup>

The second alternative—using the directory assistance services obtained from wholesale service providers—does not present a barrier because there is a sufficient number of wholesale providers of directory assistance services to choose from. Numerous firms resell ILEC DA services—either via resale *per se* or by purchasing ILEC DA wholesale services to use with UNEs or their own facilities. (See Section III.A.1 above.)

The FCC’s Third Report and Order, *supra*,<sup>2</sup> refers to additional wholesale providers of directory assistance services—*i.e.*, Clifton Forge, Consolidated Communications and Experian’s TEC Group. The FCC’s finding cited above indicates there are no apparent barriers to entering the wholesale directory assistance service market, insofar as any firm that acquires the facilities employees, real estate, computers, transport facilities and underlying subscriber information databases required to self-provide is also capable of offering wholesale directory assistance service. Other wholesale providers including CFW<sup>93</sup> and INFONXX<sup>94</sup> have been able to rapidly develop wholesale operations. CFW announced the sale of its directory assistance

---

<sup>91</sup> In the Matter of Implementation of the Local Competition Provisions of the Telecommunications Act of 1996, CC Docket No. 96-98, Third Report and Order and Fourth Further Notice of Proposed Rulemaking (adopted September 15, 1999) (“Third Report and Order”), ¶447.

<sup>92</sup> *Ibid.*, at ¶446.

<sup>93</sup> Marcia Martinek, “Rural Regional & Remunerative,” *Wireless Review* (Feb 1, 1999).

<sup>94</sup> On July 18, 2000 INFONXX, which considers itself the premier provider of Enhanced Directory Services, announced plans to expand and to locate a new facility in Greensboro, North Carolina that serves as a call center and a development lab, helping to grow their business. According to INFONXX, the new facility began operations in over 20,000 square feet of space and was expected to employ more than 350 people before the end of 2000. Forward Greensboro Economic Development Partnership Press Release, “INFONXX to Open New Facility in Greensboro, North Carolina,” <http://www.greensboro.org/EconomicDevelopment/INFONXX.htm> (July 18, 2000). As noted above, INFONXX also announced plans to build a call center in the Philippines, which may also handle US Directory Assistance traffic. See Section III.B.8.

On July 18, 2000 INFONXX, which considers itself the premier provider of Enhanced Directory Services, announced plans to expand and to locate a new facility in Greensboro, North Carolina that serves as a call center and a development lab, helping to grow their business. According to INFONXX, the new facility began operations in over 20,000 square feet of space and was expected to employ more than 350 people before the end of 2000. INFONXX Press Release, “InfoNXX Opens for Business and Begins Second Wave of Aggressive Hiring in the Greensboro Area” (October 4, 2000).

business to Telegate in July 2000.<sup>95</sup> Although CFW's successor firm, nTelos, continues to own the call centers that provide directory assistance, it leases these facilities to Telegate.<sup>96</sup>

#### **D. The relationship between competition for DA services and other telecommunications services does not support adopting Telegate's proposal.**

##### **1. Promoting competition in the "retail DA market" would not improve local competition.**

In prior sections we showed that there is already substantial competition in both the wholesale and retail aspects of the DA market. The wholesale market already directly supports local telephone competition and bolsters retail competition. This competition implies that the incremental gains from efforts to promote additional retail competition would be small. In this section, we consider the Commission's request for comments on: "whether Commission efforts to promote competition in the DA market translate into competition in the local exchange market as well" (NPRM ¶12). Given the extensive availability of wholesale DA services and the ease of entry to provide DA services that were demonstrated above, it is clear that there would be no gains to local competition from the policies being considered in this proceeding. Indeed, there could be unintended negative consequences—harm to CLECs who would lose current revenues they receive from providing retail DA services and call completion along with their local and other telecommunications services. Thus, presubscription may more likely hinder rather than aid local competition.

First, as indicated in Section III.A above, CLECs have three options for providing their own DA services—self-provisioning, resale of ILEC DA services, or purchase of ILEC DA services via UNE Ps or as a stand-alone wholesale service. Further, wholesale prices for DA services are low enough to allow entrants to compete with incumbent local and toll carriers. Wholesale DA charges were estimated to be about 29 cents per call for ordinary local DA and 44 cents per EDA call in 2000, and forecasted to decline a penny per year through 2006.<sup>97</sup> These rates are in many cases below the unregulated prices charged for DA services. Further, the profit opportunity and incentives for competition among DA services will continue to increase if ILECs are afforded regulatory relief to price their DA services to competitive levels. As explained above, the Commission's efforts to promote DA competition have already fully opened the wholesale DA market to competition. Independent providers like INFONXX, Excell Agent Services and Metro One have developed rapidly and even provide wholesale DA

---

<sup>95</sup> nTelos Press Release, "CFW Communications Finalizes Sale of Directory Assistance Operations to telegate AG" (July 12, 2000).

<sup>96</sup> *Id.*

<sup>97</sup> Frost & Sullivan, "U.S. Wholesale Directory Assistance Services Market 6046-63," pp. 21, 27 (2000).

services to the major incumbent DA providers—e.g., AT&T and Verizon—as well as to wireless mobile carriers and CLECs.<sup>98</sup>

Second, the Commission’s own data confirm that local competition has been thriving. See Section III.B above. Thus, the extensive entry into local exchange markets to date under existing DA dialing patterns demonstrates that the incremental competitive gains in the local market from stimulating competition for stand-alone retail DA services would be questionable.

Third, the data presented in section III.B.1 above show that many CLECs are purchasing wholesale DA services from ILECs as well as independent wholesale providers in connection with resale of ILEC services, use of UNE Ps and for use with their own facilities-based offerings. This enable CLECs to design, innovate and differentiate the DA service offerings that they offer to their customers in competition with ILEC DA.

Thus, no additional action on DA services is needed by the commission to stimulate local competition for telephone services. To the contrary, the presubscription or DA access code policy change could harm CLECs. CLECs could lose revenues from DA services and call completion if independent DA providers may utilize presubscription or other access code changes are mandated. In addition, diminished opportunities for building on their respective brands and the prospect for customer confusion could be harmful.

**2. The demand for full service provision of telecommunications services (i.e., one-stop shopping) implies that few customers would be interested in presubscribing to DA services.**

The market place trend to full-service provision or “one-stop shopping” for local, toll, Internet and other services implies that the majority of consumers are not likely to find enough value in presubscription to 411 service or changes in dialing code policy to justify a major cost outlay. One fundamental goal of the 1996 Act was to break down barriers between previously distinct service markets so that competitors could compete for the entire set of telecommunications services. In this section, we briefly summarize the evidence showing that demand for packaged services has changed the telecommunications marketplace. The evidence includes research on consumer demand or one-stop shopping as is confirmed by industry investments to meet that demand.

First, consumer demand for more comprehensive telecommunications services is demonstrated by numerous studies. These studies show that consumers and businesses want packages of local, long distance and other services combined in one offering from a single supplier. For example, a recent study by the Strategis Group reported that:

Telecom bundling is the new reality of the market. Consumers demand it, businesses demand it and operators are finally beginning to provide the service.

---

<sup>98</sup> Seth Schiesel, “What City, Please? Vexation in Dialing Can Start With 411,” *The New York Times* (August 27, 2000).

It's now a race among carriers to become the customer's one-stop communications partner.<sup>99</sup>

Local and long distance phone service proved to be the most popular choices for bundles, with 78 percent of consumers requesting those services in their preferred bundle.<sup>100</sup>

Demand for bundled consumer and business telecom services is strong among consumers, SOHOs, [small offices/home offices] and small-to-large-sized businesses, according to two studies by The Strategis Group. 66 percent of businesses and 63 percent of consumers are interested in purchasing bundles with at least two services.<sup>101</sup>

In addition, one article on the growing prevalence of bundling reported that:

Any carrier will tell you: "We bundle multiple telecommunications services to provide one-stop shopping for our customers."

It's an action-oriented reaction to the countless surveys that say customers are crying out for bundled services — one bill for local and long-distance phone service, wireless service, Internet access and sometimes even cable television.<sup>102</sup>

Second—consistent with the vision of the 1996 Act—telecommunications firms have blurred the distinctions between providers of local and long distance, wireless and wireline, cable TV and telephone services by moving to satisfy the demand for one-stop shopping. For example, the article cited above observed that the incumbent long distance carriers have recognized this trend and gotten a jump-start on offering packages of services:

... MCI has offered integrated MCI One packages for both residential and small business markets for more than two years. For small businesses, this means local toll, toll-free, MCI Internet, calling card, 800 number and international calling on one bill.

Business customers are looking for simplicity, flexibility and a single point of contact, so AT&T offers several voice, data, wireless and Internet access services that can be packaged together. The carrier offers integrated billing for domestic private line and voice services, including local voice in some areas. It also offers one customer service number, which routes callers to experts.<sup>103</sup>

---

<sup>99</sup> James Mendelson, analyst with The Strategis Group and lead author of study on bundling, "Survey Finds That Users Want Bundled Services," *CLEC-Planet* (Jan. 13, 2000).

<sup>100</sup> *Id.*

<sup>101</sup> "Bundle Up, Telecoms," *Communications News*, p. 10 (Apr. 1, 2000).

<sup>102</sup> S. Schmelling, "Bundling Takes on New Meaning," *Telephony*, p. 20 (July 13, 1998).

<sup>103</sup> *Id.*

Demand for more comprehensive telecommunications services is confirmed by other evidence of industry efforts to satisfy the demand. For example, the IXCs have invested considerable efforts to provide comprehensive sets of services to business customers and, more recently, to high-volume residential customers in strategically advantageous markets—e.g., in those areas in which RBOC entry into the long distance market was imminent. The evidence includes AT&T's purchase of a CLEC's (TCG's) local business network, and its acquisitions of TCI and MediaOne for the express purpose of offering the full set of local, long distance, wireless, Internet, and cable TV offerings.<sup>104</sup> Similar motives drove the MCI/WorldCom MFS/UUNet mergers. AT&T's recently announced restructuring plans do not signal that it has abandoned its local services entry strategies.<sup>105</sup> AT&T's Broadband unit, for example, plans to continue its deployment of two-way digital communications together with and cable telephony.<sup>106</sup> Numerous other firms have pursued the same strategy—investing in facilities and/or resale arrangements and marketing sets of telecommunications services to their customers. For example, Cablevision offers local telephone service in New York in combination with toll, long distance, and cable services, and offers discounts to customers who take both phone and cable service.<sup>107</sup> RCN bills itself as “the nation's first and largest facilities-based competitive provider of bundled phone, cable television and high-speed Internet services to the most densely populated markets in the U.S.”<sup>108</sup> Of course, all these integrated telecommunications providers offers DA along with their other services.

As the RBOCs have been allowed to enter the long distance market and permitted to package their local services with long distance, efforts by the others—notably the major IXCs—to provide one-stop service offerings have accelerated.<sup>109</sup> As a result of such competition, it is

---

<sup>104</sup> AT&T Press Release, “AT&T, TCI to Merge, Create New AT&T Consumer Services Unit” (Jun. 24, 1998); AT&T Press Release, “AT&T Completes TCG merger; TCG Now Core of AT&T Local Services Network Unit” (Jul. 23, 1998); “Big Mergers Revive Notion of Bundled Telecom Services,” *Video Competition Report*, <http://127.0.0.1:15841/v1?catid=9661315&md5=a973b42e877b80044cc4f8902503eeaa> (September 14, 1998)

<sup>105</sup> According to an AT&T Press Release, “AT&T To Create Family of Four New Companies; Company To Offer To Exchange AT&T Common Stock for AT&T Wireless Stock,” <http://www.att.com/press/item/0,1354,3420,00.html> (October 25, 2000), AT&T's chairman and CEO C. Michael Armstrong put it this way, “Each of these new companies will ... still be able to offer bundled services through inter-company agreements.”

<sup>106</sup> “The pace at which we have been installing those services [two-way digital communication and cable telephony] has increased sharply throughout the year and will continue in the coming months.” Dick Martin, AT&T VP, “AT&T Is Paving the Broadband Highway,” *Business Week Online Edition*, [http://www.businessweek.com/2001/01\\_02/c3714163.htm#b3714164](http://www.businessweek.com/2001/01_02/c3714163.htm#b3714164) (accessed January 2, 2001).

In addition, since AT&T's plan provides for common use of its brand name by all units, and since it emphasizes collaboration and bundled services, the restructuring should not decrease the intensity of AT&T's local services expansion and bundling for the consumer segment, either.

<sup>107</sup> See [http://www.lightpath.net/about/about\\_lightpath.html](http://www.lightpath.net/about/about_lightpath.html) (accessed May 2001).

<sup>108</sup> RCN Press Release, “RCN Announces First Quarter 2001 Results,” May 3, 2001.

<sup>109</sup> For example, when it became clear in New York that Verizon's entry into the in-region long distance market was about to be approved, WorldCom and AT&T began to market their residential local service offerings (continued...)

reasonable to anticipate that consumers' interest in one-stop services will become even stronger as better packages are marketed and IXCs are forced to accelerate their plans to offer local services in combination with their existing offerings.

**a. Consumers are not likely to be interested in 411 presubscription.**

The evolution of the market towards full service telecommunications provision and demand for one stop shopping imply that presubscription requiring a separate DA provider choice would be of minimal benefit and attraction to consumers. Thus, few customers would be likely have any interest in presubscribing to DA service; and, the incremental benefits of implementing the Telegate proposal are unlikely to be large enough so that consumers would opt for presubscription if they had to pay for the costs of implementing that policy.<sup>110</sup>

This is particularly true given how low demand is for consumer DA services at current regulated rates, for which the median major ILEC rate is only about 20 cents per call at typical DA volumes when the required DA calling allowances are factored in as shown in Exhibit 1. As noted above, the average number of DA calls is only about 2 per month, and about 60 to 80 percent of customers make one or fewer DA calls per month.

**3. The structure of the US telecommunications industry has contributed to dynamic innovative competition, without the regulations suggested by Telegate.**

The emergence of enhanced directory assistance services in the US shows that competition to provide innovative new services is already strong in the US and illustrates how the structure of the US telecommunications industry has contributed to such dynamic competition, without the types of regulation suggested by Telegate. EDA services include:

- Services that can be provided based on traditional DA databases, such as:
  1. National Directory Assistance (NDA)
  2. Call Completion
  3. Spanish and other language call centers
  4. Reverse Lookup
  5. Category Searches—a.k.a. Yellow Pages Searches—provide caller with information on businesses of a certain type, without the caller having to specify a specific business name.

---

(...continued)

aggressively. The same pattern was repeated in Texas. *See* AT&T Press Release, "AT&T Offers New Yorkers a Choice for Local Residential Phone Service," (December 1, 1999). Similarly, WorldCom encouraged New Yorkers to subscribe via its website. "MCI WorldCom Local Service for Home," <http://www.mci.com/aboutus/products/local/service.shtml> (July 13, 2000).

<sup>110</sup> In this section we address the Commission request for "comment on the level of current demand for DA and whether 411 presubscription would likely interest consumers if it were presented to them." ¶17.

- Services that use information for other types of data sources, often based on real-time or frequently updated data, such as:
  1. Weather;
  2. Traffic,
  3. Stock quotes,
  4. Sports scores.

**a. The development of competition for NDA and EDA services.**

The development of EDA services received a substantial boost from competition among the IXC's to provide NDA services. MCI initially introduced 800-CALL-INFO that provided nationwide directory listings and subsequently promoted 1010 9000. AT&T soon offered 00-INFO to compete and then added category searches and "nearest" location listings. "This opened the field of DA to providing information of all types.... In just a few years, [E]DA services have expanded to the ILECs—who added national DA services and reverse searches—and the wireless communications carriers. The services have also expanded to include concierge-like services, such as restaurant reviews."<sup>111</sup> The latter services are currently featured by firms competing to provide wireless DA services.

**b. Competition among wireless DA, Internet directory sites and wireline DA providers has added substantial market place pressure in the US to develop even more innovative services.**

The evolution of EDA services also illustrates that DA competitors include electronic options (Internet and CD-ROMs), wireless services and voice portals. The wireless and Internet companies appear to be at the leading edge of these more broadly based services. "Wireless [customers] on the go or in the car have the greatest need for enhanced services such as directions, nearest location, movie listing, and restaurants by cuisine."<sup>112</sup> For example, INFONXX announced the launch of "Platinum 411 Service" on March 18, 2002. INFONXX's new premium DA service offers highly individualized services on demand, including driving directions, hotel reservations, flight bookings, and museum and art gallery information.<sup>113</sup> As discussed above, Internet sites offer even more convenience and greater supply of ancillary information for the tens of millions of customers already on line.

---

<sup>111</sup> As a result of regulatory restrictions, concierge services are not provided by the ILECs. However, wholesale and wireless DA providers offer services that present movie listings, restaurant reservations, and traffic information. *Id.*, p. 41..

<sup>112</sup> *Id.*, p. 8.

<sup>113</sup> See INFONXX Press Release, "INFONXX Launches Platinum 411—First Concierge Service Available Through 411 Directory Assistance" (March 18, 2002).

#### 4. The Frost & Sullivan report provides useful data.<sup>114</sup>

On the basis of Frost and Sullivan's own discussion of its research methods and based on discussions with Frost and Sullivan on prior studies of other telecommunications markets, we believe that Frost and Sullivan uses standard market research methods—e.g., it does direct interviews with industry members and customers, and checks the results as much as possible for internal consistency and for consistency with published information.

A detailed (point-by-point) comparison of the Frost and Sullivan report with similar market research reports is beyond the scope of this affidavit; however, Frost and Sullivan's basic assessment of historical industry trends appears to be consistent with other material reviewed in connection with this affidavit. In addition, although each company's data provided to NERA are confidential, a comparison of the aggregate data for the major ILECs with Frost and Sullivan's data shows that they are generally consistent in two important ways:

- Both the Frost and Sullivan data on total retail DA local volumes for the industry and the data provided to NERA by the four major ILECs show a decline in wireline DA volumes. Frost and Sullivan data for 1996 to 2001 estimates a decline of about 12 percent for local DA calls; compared to the 43 percent decline we obtain using the actual data provided by the major ILECs.<sup>115</sup> These data confirm an erosion of local wireline DA volumes and reflect several competitive pressures faced by the major ILECs: (1) retail losses to alternative wireline DA providers, wireless DA, Internet services, and printed directories; and (2) wholesale losses to other firms, such as INFONXX and Metro One, that serve IXC's, wireless carriers, and independent ILECs.
- The level of Frost & Sullivan's local DA calling volume also seems reasonable. For example, they estimate a total of about 4.7 billion local DA calls for 1999 (the base year for their estimates); and the major ILEC total (including GTE, which is included in our data as part of Verizon) was about 3.8 billion calls for that year or about 81 percent of Frost & Sullivan's estimate for all ILEC local DA volumes. Given that other ILECs accounted for about 8 percent of total ILEC lines<sup>116</sup> and given that CLECs and IXCs were also providing local DA service and CLECs had a 4 percent share of access lines as of December 31, 1999,<sup>117</sup> the data appear to be relatively consistent.
- The Frost and Sullivan data appear consistent with other reports and trends from the information we have obtained.

---

<sup>114</sup> This section responds to the Commission's request for "comment on Frost and Sullivan Report's assumptions and conclusions regarding the predicted revenue and growth forecasts for the national DA market." ¶ 20.

<sup>115</sup> See section III.B.6 and Frost & Sullivan, "Market Engineering Research for the U.S. Wireline Directory Assistance Services Market 1996-2006 6044-63," p. 47 (2000).

<sup>116</sup> ICOs have 12.6 mm out of a total 162.5 mm lines reported by all ILECs as of 2000. See Federal Communications Commission Common Carrier Bureau ARMIS Report.

<sup>117</sup> Federal Communications Commission CCB Industry Analysis Division, "Local Telephone Competition at the New Millennium," Table 4 (August 2000).

- They show 5.7 billion retail wireline DA calls in 2000<sup>118</sup> which is roughly consistent with the average—i.e., is about the same as the average of two other market research reports reviewed for this affidavit. The Pelorus Group estimates 6.7 billion wireline DA calls for 2000; Kelsey group estimates about 4.9 billion wireline calls for the same year.<sup>119</sup>
- Like the other reports Frost and Sullivan data show stronger growth for wireless than for wireline DA services.
- For the level of wireless DA calling, however, Frost and Sullivan shows 753.8 million DA calls,<sup>120</sup> Pelorus shows 1.5 billion (Figure 7.4) and the Kelsey Group shows 1.1 billion wireless calls for 2000.<sup>121</sup> Thus Frost & Sullivan likely represents a relatively conservative view of the wireless DA market.

#### **IV. INTERNATIONAL INSTITUTIONAL AND MARKET CONDITIONS DIFFER SUBSTANTIALLY FROM THOSE IN THE US; THUS, THE FCC SHOULD NOT EMULATE OTHER COUNTRIES' DA POLICIES.**

##### **A. Despite institutional and market structure differences that have limited the degree of DA competition in other countries, none has adopted presubscription for DA.**

The institutional and market structure conditions that have characterized European telecommunications markets are markedly different from those of the US. First, no European country has as long a history of privately owned telecommunications firms. European telecommunications carriers had been parts of government ministries of posts, telegraph and telecommunications (PTTs), generally until the mid 1990s. Second, no European country has had market structure and regulatory requirements remotely approaching those of the US. Third, no European country, not even those that have instituted dialing changes to DA services, has as much competition for DA service as the US. That is, in stark contrast with the US—in which retail DA volumes are spread over a host of ILECs, CLECs and IXC's, and in which the major wholesale providers (or outsourcers) have included a number of independent companies—European incumbents maintain market dominance.

---

<sup>118</sup> Frost & Sullivan, "Market Engineering Research for the U.S. Wireline Directory Assistance Services Market 1996-2006 6044-63," p. 33 (2000).

<sup>119</sup> The Pelorus Group, "Enhanced Directory Assistance," Figure 7.2 (September 2001); The Kelsey Group, "U.S. Directory Assistance Call Volumes 2000-2005 (2001).

<sup>120</sup> Frost & Sullivan, "Wireless Directory Assistance Services Market, 2001-2007," p. 16 (2001)

<sup>121</sup> The Pelorus Group, "Enhanced Directory Assistance," Figure 7.4 (September 2001); The Kelsey Group, "U.S. Directory Assistance Call Volumes 2000-2005 (2001).

Any real discussion of DA markets in Europe, however, must start with an appreciation of the overwhelming dominance of the former PTTs. In addition to still being by far the leading direct providers of DA in their home countries, they are also the chief outsourcers for competitive telcos and wireless carriers, usually including their own wireless networks.<sup>122</sup>

Thus, policies that may be appropriate to stimulate competition for DA services in Europe are not right for the US.

Further, despite the potentially greater benefits from stimulating DA competition in European countries, none has adopted presubscription for DA calling. And only a few have adopted new DA dialing codes and withdrawn the incumbent's original DA dialing code, but most have not done this either. In the balance of this section, we examine the contexts of those decisions in the UK and other countries, particularly Germany.

Note that despite the institutional differences, some key underlying trends appear to be common to Europe and the US. Wireline DA calling volume is declining as: (1) "increasing use of on-line information by people at home and/or their desktops" is utilized;<sup>123</sup> (2) wireless mobile DA call volumes have been increasing;<sup>124</sup> and (3) national regulators in various countries have allowed DA prices to increase to more competitive levels. (Note that this appears to have been in response to EU policy guidance to reduce the subsidies to DA services from other services.)

Paying for DA is a relatively recent phenomenon in Europe, which is one reason the services languished for so long. Most PTTs only started charging for it in the mid-1990s and began using the new revenues to help pay for the badly needed modernization that has occurred over the past five years or so.<sup>125</sup>

Thus, to the extent European DA services are improving, at least part of the improvement must be attributed to regulatory policies allowing firms to charge remunerative rates and to competitive forces occurring independently from the policies proposed by Telegate.

---

<sup>122</sup> The Pelorus Group, "European Directory Assistance Markets," p. 25 (July 2001).

<sup>123</sup> The Pelorus Group, "European Directory Assistance Markets," p. 47 (July 2001).

<sup>124</sup> *Id.*

<sup>125</sup> The Pelorus Group, "European Directory Assistance Markets," p. 46 (July 2001).

## **B. The Oftel decision does not apply to competitive circumstances in the US.**

### **1. The central premises on which Oftel's decision is based do not apply in the US.**

Oftel's September 2001 Statement regarding "*Access codes for directory enquiry services*" starts from the following premises: "Consumers in the UK currently have no real choice over who provides directory enquiry (DQ) service.... At present UK consumers are only able to access the DQ service provided by their network operator, generally by dialing 192. There are few value-added services, variable quality of service and, in practice, no real price competition."<sup>126</sup> The key premises do not apply in the US:

- US consumers can access DA services provided by numerous other carriers besides their own local network operators;
- Numerous value-added services are available;
- Service quality is high; and
- The evidence (presented in Section III above) shows that there is substantial competition for US DA services, although historical regulatory policies keeping rates below competitive levels obscure any analysis of US price competition.

#### **a. Fundamental market structure differences imply that, unlike UK consumers, US consumers are able to access DA services from numerous strong competitors.**

UK regulatory requirements have led to a very different market structure than in the US. Even though the UK was at the forefront of European privatization and opening markets to competition, regulators did not go nearly as far as policy makers went in the US. The former UK PTT was not split into separate local and long distance operations (and, indeed, no European country took this step). Nor was the resulting fully integrated private carrier, British Telecom (BT), required to provide equal access or presubscription for competitors wishing to interconnect with its network. Oftel did not require implementation of presubscription (or "pre-selection" as it is known in the UK) for ordinary toll or local calls until 2001. According to Oftel:

Currently [as of November 2000], companies who wish to offer indirect access (that is, access to one telephone network over the lines and equipment of another) need to get their customers to dial an access code (typically three or four digits) *before* the telephone number they wish to connect with.<sup>127</sup>

---

<sup>126</sup> Paragraphs S.2 – S.3.

<sup>127</sup> CPS will become available on the BT network in its initial phase from December 2000 (it is already available on the Kingston network in Hull). There is an interim version of CPS currently available using auto-dialers (continued...)

In contrast, the US has had presubscription to toll services for many years—beginning in the mid 1980s for long distance services; and in the mid 1990s for intraLATA toll services. Furthermore, BT started with virtually all of the local and long distance business when it was originally licensed in 1984; whereas, the major US LECs are only now beginning to be allowed to provide long distance services and the associated DA services. These fundamental differences imply that, to the extent that presubscription affects demand for DA services, the US has had competitors (i.e., long distance carriers) to whom customers have been able to presubscribe for usage and associated DA services. (See section III.A.1, above). In addition, the UK did not require unbundling of network elements to stimulate competition but instead chose a course utilizing access codes to allow firms to compete for calling via the incumbent's network.

Furthermore, the share of all UK—wireline and wireless—DA calls handled by BT was estimated to be 85 percent in 2000. This share includes the calls BT handles for its own cell phone operation, as well as for other competing local and toll carriers. The remaining 15 percent were handled by Cable and Wireless (9.3 percent), which has its own local and long distance operations and competes for wholesale DA calls as well; wireless carrier Vodafone (4.3 percent); and Conduit/Sonera—which was providing DA for wireless provider Orange (1.4 percent).<sup>128</sup> In contrast, no single company in the US has a share remotely close to BT's share of the UK DA calling; the major ILECs in total accounted for only about 52 percent of total wireline DA calling volumes for 2000.<sup>129</sup> In addition, the current estimates of wireless DA volumes and use of alternative DA providers by Verizon Wireless and other wireless competitors enforces the fact that the major ILECs—even as a group—do not come close to BT's share of DA call volumes.

**b. Oftel's concerns about value added DA services and service quality have little if any relevance to the US.**

As noted above, Oftel's concerns about value-added DA services and service quality do not apply to the US situation. First, although BT was not providing call completion to wireline customers as late as July 2001, this service was available from many US LECs by that time. (See section III.B above.) In addition, numerous other value added services are available from both incumbents and competitors. (See section III.B.3 above.)

---

(...continued)

known as ICPS; however, as this is due to be partially replaced by CPS in December 2000 (and totally replaced in December 2001) it is outside the timeframe for this consultation document. See Oftel, "Access codes for directory enquiry services, Consultation document issued by the Director General of Telecommunications," Oftel, ¶¶3.1-3.2 (November 2000).

<sup>128</sup> The Pelorus Group, "European Directory Assistance Markets," pp. 116-124 (July 2001).

<sup>129</sup> Frost & Sullivan, "Wireline Directory Services Market 6050-63," p. 42 (2001).

Second, the ILECs are subject to service level performance mandated by most state commissions, such as response time standards; and, although competitive providers are generally not subject to the same rules, service quality appears to be high in the US. According to a recent *New York Times* article:

By most official measurements, at least, directory assistance is working pretty well.

The Federal Communications Commission, which receives some 1,900 complaints a day from the public, could count only 15 that had anything to do with directory assistance in the six weeks from the beginning of July to the middle of August.

And the New York State Public Service Commission, one of the nation's most active state telephone regulators, says that while it has received 8,200 complaints so far this year about phone companies, fewer than three dozen were about directory assistance.

Verizon... data ... indicates that the average time spent on hold by each of its nearly three million daily directory assistance callers in the area formerly served by Bell Atlantic declined from 5.5 seconds in 1996 to 3.6 seconds this year....<sup>130</sup>

In contrast to the low proportion of complaints accounted for by DA, recent data from the New York Public Service Commission show that about 22 percent of complaints were classified as slamming complaints.<sup>131</sup>

**c. The UK starts with less DA competition and value added services; thus, the incremental benefits are likely to be much smaller in the US.**

The differences in starting points for the UK and US are crucial to assessing the incremental gains that can be achieved by implementing either changes in dialing code policy or presubscription. Since the level of competition and service deployment is lower in the UK, the incremental gains are apt to be greater and more likely to offset the incremental costs than they would be in the US.

---

<sup>130</sup> Seth Schiesel, "What City, Please? Vexation in Dialing Can Start With 411," *The New York Times* (August 27, 2000).

<sup>131</sup> According to New York Public Service Commission, "Monthly Report on Consumer Complaint Activity" (January 2002), 238 of the 1,071 complaints about telecommunications companies were about slamming.

**2. Oftel's market research does not imply that US policies should be changed; indeed, it suggests that it is not necessary to eliminate the 411 code.**

Oftel bases its decision in part on a survey of consumer opinions regarding DA dialing. In explaining why it believes that the benefits exceed the costs of withdrawing the 192 code (the UK's roughly equivalent code to 411), Oftel pointed out its own "market research found that over 60% of consumers would be either content or unconcerned if 192 were withdrawn."<sup>132</sup> They also acknowledge, however, that "[t]he survey results indicate a marked ambiguity in attitude towards 192."<sup>133</sup> And the Oftel report on the survey itself found that: "Despite the majority saying they wouldn't mind if the 192 code was replaced (figure 4g) the majority then said that when given the choice they felt it was more important to keep the existing 192 number than have a wider choice of DQ services (figure 4h)."<sup>134</sup> Further, a review of Oftel's own report on the survey (as opposed to the Oftel DQ decision) shows that:

- Notwithstanding Oftel's conclusions, when given an explicit choice, most UK consumers (59%) would have rather kept the 192 code than have a wider choice (18%). Further, among the set of respondents reporting that they used DQ services at least once per month, 68 percent said they would rather retain 192, while only 24% said they would rather have a wider choice.<sup>135</sup>
- When asked if they would use new companies offering different types of DQ services at different prices or whether they would continue to use 192 service, 30% of those using DQ at least once per month said they would use new DQ services and 58% said they would use 192 (and 12% said they "don't know").<sup>136</sup>

Thus, one reasonable interpretation of Oftel's survey results is that consumers would like to retain the existing option of using 192, yet competitors using different codes could still capture a sizeable share of DQ services. Of course, the lack of concern about the 192 code also suggests that keeping the code does not necessarily put competitors at a disadvantage.

In the US context, in which many consumers are already using DA codes besides 411, these findings show that competition does not require withdrawal of the 411 code; and that they would prefer to retain that option, even if other codes were made available.

---

<sup>132</sup> Oftel, Director General of Telecommunications, Statement regarding "Access codes for directory enquiry services," September 19 2001 at S.8

<sup>133</sup> *Ibid.* at para. 1.10..

<sup>134</sup> Oftel, *Consumers use of fixed telecoms services: Summary of Oftel residential survey, Q3 November 2000*, published February 2001.

<sup>135</sup> *Ibid.*, Figure 4h.

<sup>136</sup> *Ibid.*, Figure 4i.

### **3. The cost-benefit analysis done for Oftel does not apply to the US.**

The costs do not apply to the US for obvious reasons. First, the equipment and network structure differ, and there are many more LECs in the US. Thus, coordinating numbering changes would be more costly.

Second, there are multiple regulatory authorities—rather than a single national authority; thus, implementing the needed changes for LEC DA regulation that should accompany any change in numbering—e.g., eliminating asymmetric regulatory requirements on the ILECs—would be much more complex and the prospect that it would not be done in a coordinated manner could result in efficiency losses here for reasons explained in section V below.

The main benefits claimed by the UK study are not likely to accrue in the US. The study identified four types of benefits and determined that two were not worth quantifying for reasons that we believe apply in the US as well. The study found that the gains from greater innovation and improved cost efficiency are limited. BT is already subject to pressure for cost efficiency through competition at the wholesale level. This is true in US and, combined with the efficiency enhancing properties of price cap regulation, ensures that all US DA providers already have a substantial incentive to minimize costs.

Thus, the benefits examined in the UK cost-benefit study are from lower prices and increased demand for DA services and end user calling volumes. They assume 40 pence per DQ call (about 60 cents per call), calculate the potential reduction from increased retail DA competition driving down the retail rates toward wholesale DA charges—i.e., from eliminating 90 percent of the margin in the scenario that Oftel selected, and estimate the benefits associated with greater use of the network for calling based on the assumption that each added DA call will add two new network calls. None of these assumptions necessarily apply in the US. But, more importantly, there is much less room for price reductions in the US—especially for the local DA calls that constitute the bulk of the total. This is because—factoring in the calling allowance—the median price for the average number of US DA calls is only 22 cents per call already; thus, there is little or no scope for decline, at least for residence customers. Businesses already have even more options than residence customers in the US, so the Telegate proposal is not likely to improve business rates. If anything, the Telegate proposal will increase the urgency to allow DA prices to increase to competitive levels. Thus, the major basis on which the Oftel cost-benefit analysis is based does not apply in the US.

## **C. Experience in other countries does not support Telegate’s proposal in the US.**

### **1. US competitive and regulatory conditions differ from those in countries that have adopted some form of DA changes in dialing code policy.**

#### **a. Regulatory conditions differ.**

Regulatory conditions in Germany and other European countries have differed fundamentally from those in the US. These differences contributed to poor DA performance—especially in Germany—by the incumbent DA provider. As a result, the potential gains in Germany at the time it implemented DA policy changes were vastly larger than they would be in the US today. In particular, Germany has benefited from changes in dialing code policy for DA providers for the following reasons that do not apply in the US:

- Until the mid 1990’s, Deutsche Telecom (DT) was a vertically integrated, publicly owned monopoly, and faced little competition for telecommunications services within Germany. In fact, DT still serves 98 percent of local lines<sup>137</sup> and 60 percent of national toll service.<sup>138</sup> Unlike DT and other former PTTs, the ILECs compete with major established firms—like AT&T, WorldCom and Sprint—that have their own well-established brands, and the ILECs have been under competitive pressure for DA services for many years. Further, the ILECs’ share of the US national DA market is already much lower than the incumbents’ shares are after liberalization in Germany or Ireland, the two countries that Telegate cites. According to the Kelsey Group, the LEC/CLEC share of US DA revenues was about 28 percent in 2000.<sup>139</sup>
- “Germany was ripe for alternative [DA] service because well into the 1990s Deutsche Telecom’s service was among the slowest and least efficient in Europe. Slow response times, particularly in peak periods, meant that 20 percent of DA callers weren’t getting through to operators.”<sup>140</sup> The ILECs’ performance is vastly superior to this. (See section IV.B.1 above.)
- DT allowed its DA service to lose money and deteriorate in quality because, like other former European PTTs: (1) it had been required to subsidize DA services; (2) its costs were high due to “inefficient legacy platforms” and “large numbers of public employees whom they could not dismiss, so there was little political incentive to institute ...

<sup>137</sup> RegTP, “Competition in the Local Access Market,” [http://www.regtp.de/imperia/md/content/en/aktuelles/report\\_2001.pdf](http://www.regtp.de/imperia/md/content/en/aktuelles/report_2001.pdf) (July 2001).

<sup>138</sup> Market share measured in minutes. RegTP, „2. Tätigkeitsbericht, für die Jahre 2000 und 2001 vorgelegt,“ <http://www.regtp.de/imperia/md/content/aktuelles/Bericht2001.pdf>.

<sup>139</sup> The Kelsey Group, “US DA Revenues Forecast 2000 – 2005” (2001).

<sup>140</sup> The Pelorus Group, “European Directory Assistance Markets,” p. 60 (July 2001).

efficiency enhancing technologies.”<sup>141</sup> In contrast, the US has not had to make the transition from public to private ownership and, thus, the ILECs did not have “large numbers of public employees....”. In addition, although some US companies may also have been losing money on DA services because regulatory policies kept DA rates below costs, US ILECs’ DA service quality and efficiency have been promoted by: (1) reduced regulation—e.g., 28 states have deregulated or declared DA services to be competitive—thereby allowing the LECs to set DA prices at more efficient competitive levels; (2) price cap regulations that have provided incentives to act efficiently to generate efficient DA platforms and keep costs down; (3) competition from other DA providers competitors—especially toll carriers, who also provide DA services to ILEC customers, and CLECs, who compete for the entire service package, including DA—further enhances the ILECs’ incentives to compete; and (4) service quality regulations require that ILECs maintain satisfactory DA service quality.

**2. The two-tiered US regulatory structure means that implementing drastic changes in DA dialing patterns would be more costly here than in Europe.**

Unlike the US—in which the FCC sets national policies, and the states control local pricing and regulation—Germany, the UK, Ireland and Spain each has a single regulator that controls policies at both the national and local level. Thus, implementing the policy changes that reconcile regulation and pricing of DA services with new dialing patterns that would force consumers to make a new choice—e.g., presubscription or withdrawal of the 411 code—is much less complicated in other countries than in the US. In the US it would be necessary to simultaneously adjust varying state regulatory policies to reflect the FCC’s mandate—e.g., to eliminate asymmetric regulation of the incumbents and competitors by giving the incumbents the same freedom to market and price their DA services as any other DA provider would have. Failing to do so would reduce efficiency. However, the complexity of such coordinated action is greater here than in European countries.

**3. The majority of EU members have not adopted policies such as those recommended by Telegate.**

A summary of European DA access code policies from the Oftel November 2000 Consultation Document shows that no country adopted presubscription for DA services, and only a minority of the countries adopted new dialing codes and required the incumbent to give up their historical dialing code.<sup>142</sup>

---

<sup>141</sup> *Id.* According to the report conditions were similar in most European countries. “There simply was no driving motivation for most of the big carriers to make substantial new investments in DA when there was no payback....DA was a losing proposition ...and they tended to discourage use by benign neglect. What they wanted customers to do was consult paper directories or, as in France, the Minitel system.” (p. 60)

<sup>142</sup> At the time of Oftel’s analysis in November 2000, only three countries—Germany, Ireland, and Sweden—required its incumbent LECs to forfeit its historical dialing codes.

**V. ASSESSING COSTS AND WHO SHOULD PAY FOR IMPLEMENTING DA POLICY CHANGES IF THE COMMISSION WERE TO ADOPT THEM.**

**A. Economic principles imply that those who demand and benefit from an activity must pay for the associated costs.**

If the commission were—incorrectly, in our opinion—to adopt either presubscription or new dialing requirements, the correct way to recover the costs is from the parties that cause the costs to be incurred and that benefit from presubscription.

As explained above, a basic principle of economics is that costs should be recovered from the person or firm that causes the costs to be incurred. If this principle is violated because the parties demanding the service—i.e., presubscription to the 411 code or changes in dialing code policy for DA services—do not pay for implementation costs, then equal access could be demanded prematurely, and various DA providers and customers would not face the cost consequences of their decision to purchase DA services. This would raise overall costs since technological change and other sources of declining costs would not be fully realized. It would also raise the costs of the LECs who do not need equal access.

More specifically, requiring that entrants into a regulated market pay the costs they create by entry ensures that only efficient entry takes place. Economists agree with this principle because it recognizes that entry into markets previously served by single suppliers and subsequent competition in those markets is not an end in itself. Rather, social policy should favor entry and competition where such entry ensures that customers are made better off by that entry. Where social policy attempts to ensure entry and survival of suppliers less efficient than incumbents, consumers typically pay for these protections in higher prices or poorer services.

Competitive market processes do not force incumbents to eliminate their historical brands or change their service characteristics to stimulate entry. Entrants in competitive markets must incur their own marketing costs to establish their brand names and publicize their locations and product characteristics to consumers. There is no justification for departing from this normal competitive process; specific telephone numbers are not essential facilities.

**B. The costs of DA dialing code changes requested by Telegate require a comprehensive, detailed analysis.**

**1. The direct costs of dialing code changes include numerous components.**

The costs of the policy changes under consideration in the NPRM include:

- the direct costs of implementing the changes:

- For 411 presubscription, these costs include: (1) network costs; (2) OSS costs; (3) balloting and allocation costs—including the marketing costs for the incumbents and entrants;
- For addition of a DA PIC to all switches, these costs include: (1) Switch development, (2) network modifications and 3) balloting and allocation costs—including the marketing cost for the incumbents and entrants;
- For new DA dialing access codes, the costs include: (1) costs for allocating and administering new codes, (2) customer education and marketing, (3) switch modification costs, (4) routing costs to divert calls to alternative providers;
- For eliminating the current 411 and 555 1212 codes, the direct costs include added customer care and educational costs—e.g., for notifying customers and placing announcements on switches—and added network costs associated with additional calls to the alternative provider;
- For assigning national 555 numbers to DA Providers, the costs include: (1) INC guideline changes, 2) notifications of code assignment, and (3) establishment of ordering, provisioning, and billing processes.
- Ongoing operating costs for:
  - Network and OSS changes and maintenance;
  - Billing—including the added transactions costs of billing DA providers;
  - Customer education and customer care—e.g., need to explain additional options when customers request new services, and need to handle consumer questions and complaints.

The direct costs of the policies recommended by Telegate—i.e., presubscription or dialing code changes coupled with elimination of 411—may be very large. Verizon has provided data to NERA indicating that the network upgrades to enable presubscription by customers in its service area *alone* would cost at least \$190 million, including addition of AIN and other necessary switch capabilities, and additions to its SS7 network. This does not include the cost for modifying numerous operation support systems and necessary processes which are still being reviewed and calculated by Verizon. And, it does not include the costs for balloting and assignments of subscribers—which were estimated by the major ILECs to be over \$400 million.<sup>143</sup> These amounts do not include the ongoing costs enumerated above. The significant direct costs for the major LECs are only part of the total cost story. The costs to upgrade the networks of the small independent LECs would likely be significant as well. Many of the

---

<sup>143</sup> See Ex Parte presentation of BellSouth, SBC, Qwest, and Verizon, December 14, 2000, p. 2.

smaller independent telephone companies may not have made the kinds of changes to their network infrastructure to accommodate the type of dialing capability that has been considered by the other firms. Requiring changes to their networks could represent a major technical/economic hurdle to the small LECs. Furthermore, the cost estimates must also account for the costs to be borne by the CLECs and IXC's whose DA businesses would also be affected by policies that were applied symmetrically to the entire industry.

## **2. The indirect costs of dialing code changes could be large.**

The indirect costs associated with dialing code changes fall into two broad categories:

- Costs associated with customer confusion and customer complaints about problems such as slamming that would be possible if 411 presubscription were implemented, and cramming that could occur under presubscription or the dialing code changes under consideration.
- Costs associated with asymmetric regulation.

The indirect costs also include the opportunity costs imposed on consumers to educate themselves about the choices that may be offered and the costs of taking the time to “vote”; and the costs to consumers that might be occasioned by needing to make calls to register complaints about being switched to a new provider—if they had simply been allocated to that provider rather than having been presubscribed. As described above, consumers have voiced very few complaints about DA service to regulators; however, if presubscription or any of the policies under consideration are implemented, this would likely change. Prior experience with toll presubscription suggests that with 411 presubscription, slamming would become a problem because new DA providers may find it advantageous to capitalize on the likely customer confusion associated with the implementation of DA presubscription and sign up customers without their consent. Slamming has been among the more common customer complaints for services subject to presubscription. According to recent data, about 25 percent of complaints to the New York State Public Service Commission were for slamming—i.e., unauthorized changes of presubscription for toll services.<sup>144</sup> With or without presubscription, cramming or at least complaints about excessive DA charges could be a problem because new DA providers may charge consumers more than they expect for directory assistance. The costs to the customer arise because the customer would have to take the time to call his or her telecommunications provider; and, then (after the provider incurred the costs to for added business office representatives who would have to explain to the customer that the charges were from the DA provider) incur the costs to complain to the DA provider. The added charges would be compounded if consumers elect to use call completion and are charged long distance rates above those of their 1 + dialing plans.

---

<sup>144</sup> New York Public Service Commission, “Monthly Report on Consumer Complaint Activity” (January 2002).

### 3. The indirect costs of asymmetric regulation should also be considered.

The NPRM asks: would it be necessary for the FCC to establish minimum regulatory guidelines so that state PUCs can apply regulations to all competitors? If so, should all competitive DA providers be subject to such guidelines, or should regulation only be reserved for those providers with more than a *de minimis* share of the DA market? (¶ 55) “All competitors” in wireline DA services would necessarily include ILECs, CLECs, IXCs and independent DA providers. Today, ILEC DA services are subject to state regulation and in the majority of states, ILEC rates are restricted by regulations that do not apply to their competitors.

Rates are moving toward more competitive levels as 22 states have given some form of pricing flexibility and eliminated mandatory DA calling allowances for the ILECs.<sup>145</sup> Nevertheless, as noted above, many states still constrain ILEC DA pricing, while few if any states impose any regulatory conditions on competitors’ DA pricing. Further, an even larger number of states impose other requirements on ILEC DA services.<sup>146</sup> Thus, one complexity of requiring either 411 presubscription or changes in dialing code policy is that the differing mix of state regulatory policies and requirements would result in a divergent set of impacts on the companies, competitors and customers. Therefore, adopting Telegate’s proposal would impose additional asymmetric regulatory burdens on the ILECs. Further, to enable meaningful economic competition in that context, it would become even more important to accelerate the removal of restrictions on the rates the ILECs could charge and could require the regulators to impose the same requirements on all telephonic DA providers. In the absence of such reductions or uniform regulation of all competitors at the state level, the indirect costs of implementing Telegate’s proposal would be even greater, as the ILECs would continue at a regulatory disadvantage.

### C. Conclusion

The combination of (1) already robust competition among wireline carriers (ILECs, CLECs, and IXCs), independent DA service providers, wireless DA, and print, Internet and CD-ROM directories; (2) the lack of entry barriers; (3) the potentially large direct and indirect cost to consumers; and (4) the potential harm to CLECs who could lose DA revenue streams indicate that the neither 411 presubscription nor dialing code changes requested by Telegate are economically justified or warrant regulatory intervention in the DA services market.

---

<sup>145</sup> See Exhibit 1.0.

<sup>146</sup> The NPRM recognizes that: State commissions have traditionally imposed requirements related to DA service on ILECs for quality of service, speed-of-answer, price, number of free DA calls per month, or, in the case of people with disabilities, free DA service. (¶. 55)

**WILLIAM E. TAYLOR**  
**BUSINESS ADDRESS**

National Economic Research Associates, Inc.  
One Main Street  
Cambridge, Massachusetts 02142  
(617) 621-2615

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**

- 1988- NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC. (NERA)  
Senior Vice President, Office Head, Telecommunications Practice Director.
- 1983-1988 BELL COMMUNICATIONS RESEARCH, INC. (Bellcore)  
Division Manager, Economic Analysis, formerly Central Services Organization, formerly American Telephone and Telegraph Company: theoretical and quantitative work on problems raised by the Bell System divestiture and the implementation of access charges, including 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.
- 1975-1983 BELL TELEPHONE LABORATORIES  
Member, Technical Staff, Economics Research Center: basic research on theoretical and applied econometrics, focusing on small sample theory, panel data and simultaneous equations systems.
- Fall 1977 MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
Visiting Associate Professor, Department of Economics: taught graduate courses in econometrics.
- 1974-1975 CENTER FOR OPERATIONS RESEARCH AND ECONOMETRICS  
Université Catholique de Louvain, Belgium.  
Post Doctoral Research Associate: basic research on finite sample econometric theory and on cost function estimation.
- 1972-1975 CORNELL UNIVERSITY  
Assistant Professor, Department of Economics. (On leave 1974-1975.) taught graduate and undergraduate courses on econometrics, microeconomic theory and economic 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.

**PUBLICATIONS**

- “Smoothness Priors and Stochastic Prior Restrictions in Distributed Lag Estimation,”  
*International Economic Review*, 15 (1974), pp. 803-804.
- “Prior Information on the Coefficients When the Disturbance Covariance Matrix is Unknown,”  
*Econometrica*, 44 (1976), pp. 725-739.
- “Small Sample Properties of a Class of Two Stage Aitken Estimators,” *Econometrica*, 45  
(1977), pp. 497-508.
- “The Heteroscedastic Linear Model: Exact Finite Sample Results,” *Econometrica*, 46 (1978),  
pp. 663-676.
- “Small Sample Considerations in Estimation from Panel Data,” *Journal of Econometrics*, 13  
(1980) pp. 203-223.
- “Comparing Specification Tests and Classical Tests,” Bell Laboratories Economics Discussion  
Paper, 1980 (with J.A. Hausman).
- “Panel Data and Unobservable Individual Effects,” *Econometrica*, 49 (1981), pp. 1377-1398  
(with J.A. Hausman).
- “On the Efficiency of the Cochrane-Orcutt Estimator,” *Journal of Econometrics*, 17 (1981), pp.  
67-82.
- “A Generalized Specification Test,” *Economics Letters*, 8 (1981), pp. 239-245 (with J.A.  
Hausman).
- “Identification in Linear Simultaneous Equations Models with Covariance Restrictions: An  
Instrumental Variables Interpretation,” *Econometrica*, 51 (1983), pp. 1527-1549 (with J.A.  
Hausman).
- “On the Relevance of Finite Sample Distribution Theory,” *Econometric Reviews*, 2 (1983), pp.  
1-84.
- “Universal Service and the Access Charge Debate: Comment,” in P.C. Mann and H.M. Trebing  
(editors), *Changing Patterns in Regulation, Markets, and Technology: The Effect on Public  
Utility Pricing*. The Institute of Public Utilities, Michigan State University, 1984.
- “Recovery of Local Telephone Plant Costs under the St. Louis Plan,” in P.C. Mann and H.M.  
Trebing (editors), *Impact of Deregulation and Market Forces on Public Utilities*. The  
Institute of Public Utilities, Michigan State University, 1985.
- “Access Charges and Bypass: Some Approximate Magnitudes,” in W.R. Cooke (editor),  
*Proceedings of the Twelfth Annual Telecommunications Policy Research Conference*, 1985.
- “Federal and State Issues in Non-Traffic Sensitive Cost Recovery,” in *Proceedings from the  
Telecommunications Deregulation Forum*. Karl Eller Center, College of Business and  
Public Administration, University of Arizona, Tucson, Arizona, 1986.
- “Panel Data” in N.L. Johnson and S. Kotz (editors), *Encyclopedia of Statistical Sciences*. John  
Wiley & Sons, New York, 1986.
- “An Analysis of Tapered Access Charges for End Users,” in P.C. Mann and H.M. Trebing  
(editors), *New Regulatory and Management Strategies in a Changing Market Environment*.

- The Institute of Public Utilities, Michigan State University, 1987 (with D.P. Heyman, J.M. Lazorchak, and D.S. Sibley).
- “Efficient Estimation and Identification of Simultaneous Equation Models with Covariance Restrictions,” *Econometrica*, 55 (1987), pp. 849-874 (with J.A. Hausman and W.K. Newey).
- “Alternative NTS Recovery Mechanisms and Geographic Averaging of Toll Rates,” in *Proceedings of the Thirteenth Annual Rate Symposium: Pricing Electric, Gas, and Telecommunications Services*. The Institute for the Study of Regulation, University of Missouri, Columbia, 1987.
- “Price Cap Regulation: Contrasting Approaches Taken at the Federal and State Level,” in W. Bolter (editor), *Federal/State Price-of-Service Regulation: Why, What and How?*, Proceedings of the George Washington University Policy Symposium, December, 1987.
- “Local Exchange Pricing: Is There Any Hope?,” in J. Alleman (editor), *Perspectives on the Telephone Industry: The Challenge of the Future*. Ballinger Publishing Company, Cambridge, Massachusetts, 1989.
- “Generic Costing and Pricing Problems in the New Network: How Should Costs be Defined and Assessed,” in P.C. Mann and H.M. Trebing (editors) *New Regulatory Concepts, Issues, and Controversies*. The Institute of Public Utilities, Michigan State University, 1989.
- “Telephone Penetration and Universal Service in the 1980s,” in B. Cole (editor), *Divestiture Five Years Later*. Columbia University Press, New York, New York, 1989 (with L.J. Perl).
- “Regulating Competition for IntraLATA Services,” in *Telecommunications in a Competitive Environment*, Proceedings of the Third Biennial NERA Telecommunications Conference, 1989, pp. 35-50.
- “Costing Principles for Competitive Assessment,” in *Telecommunications Costing in a Dynamic Environment*, Bellcore-Bell Canada Conference Proceedings, 1989 (with T.J. Tardiff).
- “Optional Tariffs for Access in the FCC's Price Cap Proposal,” in M. Einhorn (ed.), *Price Caps and Incentive Regulation in the Telecommunications Industry*. Kluwer, 1991 (with D.P. Heyman and D.S. Sibley).
- “Alternative Measures of Cross-Subsidization,” prepared for the Florida Workshop on Appropriate Methodologies for the Detection of Cross--Subsidies, June 8, 1991.
- “Predation and Multiproduct Firms: An Economic Appraisal of the Sievers-Albery Results,” *Antitrust Law Journal*, 30 (1992), pp. 785-795.
- “Lessons for the Energy Industries from Deregulation in Telecommunications,” *Proceedings of the 46th Annual Meeting of the Federal Energy Bar Association*, May 1992.
- “Efficient Price of Telecommunications Services: The State of the Debate,” *Review of Industrial Organization*, Vol. 8, pp. 21-37, 1993.
- “Status and Results of Regulatory Reform in the U.S. Telecommunications Industry,” in C.G. Stalon, *Regulatory Responses to Continuously Changing Industry Structures*. The Institute of Public Utilities, Michigan State University, 1992.
- “Post-Divestiture Long-Distance Competition in the United States,” *American Economic Review*, Vol. 83, No. 2, May 1993 (with Lester D. Taylor). Reprinted in E. Bailey, J. Hower, and J. Pack, *The Political Economy of Privatization and Deregulation*. London: Edward Elgar, 1994.
- “Comment on ‘Pricing of Inputs Sold to Competitors,’ by W.J. Baumol and J.G. Sidak,” *Yale Journal on Regulation*, Vol. 11, Issue 1, 1994, pp. 225-240 (with Alfred E. Kahn).

- “Comments on Economic Efficiency and Incentive Regulation,” Chapter 7 in S. Globerman, W. Stanbury and T. Wilson, *The Future of Telecommunications Policy in Canada*. Toronto: Institute for Policy Analysis, University of Toronto, April 1995.
- “Revising Price Caps: The Next Generation of Incentive Regulation Plans,” Chapter 2 in M.A. Crew (ed.) *Pricing and Regulatory Innovations under Increasing Competition*. Boston: Kluwer Academic Publishers, May 1996 (with T. Tardiff).
- “An Analysis of the State of Competition in Long-Distance Telephone Markets,” *Journal of Regulatory Economics*, May 1997, pp. 227-256 (with J.D. Zona).
- “An Analysis of the Welfare Effects of Long Distance Market Entry by an Integrated Access and Long Distance Provider,” *Journal of Regulatory Economics*, March 1998, pp. 183-196 (with Richard Schmalensee, J.D. Zona and Paul Hinton).
- “Market Power and Mergers in Telecommunications,” *Proceedings of the Institute of Public Utilities; 30<sup>th</sup> Annual Conference: Competition in Crisis: Where are Network Industries Heading?* The Institute of Public Utilities, Michigan State University, 1999.
- “The Baby and the Bathwater: Utility Competition, But at What Price?,” *Public Utilities Fortnightly*, Vol. 137, No.21, November 15, 1999, pp. 48-56 (with Anne S. Babineau and Matthew M. Weissman).

## **TESTIMONIES**

### **Access Charges**

- Florida Public Service Commission (Docket No. 820537-TP), July 22, 1983.
- Arkansas Public Service Commission (Docket No. 83-042-U), October 7, 1985.
- Public Utility Commission of Texas (Docket No. 8585), December 18, 1989.
- Mexican Secretariat of Communications and Transport, affidavit filed October 18, 1995 (with T. Tardiff).
- Federal Communications Commission (CC Docket No. 96-98), affidavit July 8, 1996; *ex parte* letters filed July 22, 1996 and July 23, 1996.
- Federal Communications Commission (CC Docket No. 96-262 et. al.) with Richard Schmalensee, January 29, 1997). Rebuttal February 14, 1997.
- New York Public Service Commission (Case 94-C-0095 and 28425), Panel Testimony, May 8, 1997. Rebuttal Panel Testimony July 8, 1997.
- Pennsylvania Public Utility Commission (Docket No. I-00960066), June 30, 1997. Rebuttal July 29, 1997. Surrebuttal August 27, 1997.
- Connecticut Department of Public Utility Control (Docket No. 96-04-07), October 16, 1997.
- Federal Communications Commission (*ex parte* CC Docket No. 96-262 et. al.), with Richard Schmalensee, January 21, 1998.
- Federal Communications Commission (CCB/CPD 98-12), March 18, 1998.
- Federal Communications Commission (CC Docket Nos. 96-262, 94-1, 97-250 and RM 9210), October 26, 1998. Reply November 9, 1998.
- Federal Communications Commission (Docket No. 99-24), with Karl McDermott, January 20, 1999. Reply April 8, 1999.
- Vermont Public Service Board (Docket No. 6167), May 20, 1999. Supplemental May 27, 1999.

Virginia State Corporation Commission, (Case No. PUC 000003), May 30, 2000.  
Maryland Public Service Commission (Case No. 8745), March 23, 2001. Rebuttal May 21,  
2001. Surrebuttal June 11, 2001.

### **Incentive and Price Cap Regulation**

Federal Communications Commission (Docket No. 87-313), March 17, 1988.  
Florida Public Service Commission (Docket No. 880069-TL), June 10, 1988.  
Federal Communications Commission (Docket No. 87-313), August 18, 1988. Rebuttal  
November 18, 1988.  
New Hampshire Public Service Commission (Docket 89-010), March 3, 1989.  
Federal Communications Commission (Docket No. 87-313), June 9, 1989.  
Federal Communications Commission (Docket No. 87-313), August 3, 1989. (2 filings)  
New York State Public Service Commission (Case 28961 - Fifth Stage), September 15, 1989.  
Georgia Public Service Commission (Docket No. 3882-U), September 29, 1989.  
Federal Communications Commission (Docket 87-313), May 3, 1990.  
Federal Communications Commission (Docket 87-313), June 8, 1990 (2 filings).  
State of Maine Public Utilities Commission (Docket No. 89-397), June 15, 1990.  
Montana Public Service Commission (Docket No. 90.8.46), October 4, 1990.  
Federal Communications Commission (Docket 87-313), December 21, 1990.  
Tennessee Public Service Commission, February 20, 1991.  
Federal Communications Commission (Docket 87-313) with Alfred E. Kahn), June 12, 1991.  
California Public Utilities Commission (Phase II of Case 90-07-037) with Timothy J. Tardiff,  
August 30, 1991. Supplemental testimony January 21, 1992.  
Rhode Island Public Utilities Commission (Docket No. 1997), September 30, 1991.  
Montana Public Service Commission (Docket No. 90.12.86), November 4, 1991. Additional  
testimony January 15, 1992.  
Federal Communications Commission (Pacific Bell Tariff F.C.C. No. 128, Transmittal No.  
1579) with T.J. Tardiff, April 15, 1992. Reply comments July 31, 1992.  
California Public Utilities Commission (Docket No. I.87-11-033), with T.J. Tardiff, May 1,  
1992.  
Delaware Public Utilities Commission (Docket No. 33), June 22, 1992.  
Florida Public Service Commission (Docket No. 920260-TL), December 18, 1992.  
California Public Utilities Commission (Docket No. I.87-11-033), with T.J. Tardiff, April 8,  
1993, reply testimony May 7, 1993.  
Canadian Radio-Television and Telecommunications Commission (Docket No. 92-78), with  
T.J. Tardiff, April 13, 1993 (2 filings).  
Federal Communications Commission (Petition for Declaratory Ruling and Related Waivers to  
Establish a New Regulatory Model for the Ameritech Region), April 16, 1993. Reply  
Comments, July 12, 1993.  
Delaware Public Utilities Commission (Docket No. 33), June 1, 1993. Supplementary  
statement, June 7, 1993. Second supplementary statement," June 14, 1993.  
Vermont Public Service Board (Dockets 5700/5702), September 30, 1993. Rebuttal testimony  
July 5, 1994.  
Pennsylvania Public Utility Commission (Docket No. P-009350715), October 1, 1993.  
Rebuttal January 18, 1994.

Massachusetts Department of Public Utilities (Docket No. D.P.U. 94-50), April 14, 1994.  
Rebuttal October 26, 1994.  
Federal Communications Commission (CC Docket 94-1), May 9, 1994. Reply June 29, 1994.  
Federal Communications Commission (CC Docket 94-1) with R. Schmalensee, May 9, 1994.  
Reply June 29, 1994.  
New York State Public Service Commission (Case 92-C-0665), panel testimony, October 3, 1994.  
State of Maine Public Utilities Commission (Docket Nos. 94-123/94-254), December 13, 1994.  
Rebuttal January 13, 1995.  
Canadian Radio-Television and Telecommunications Commission (Application of Teleglobe Canada for Review of the Regulatory Framework of Teleglobe Canada Inc.), December 21, 1994.  
Kentucky Public Service Commission, testimony re concerning telecommunications productivity growth and price cap plans, April 18, 1995.  
California Public Utilities Commission (U 1015 C), May 15, 1995. Rebuttal January 12, 1996.  
State of Connecticut, Department of Public Utility Control (DPUC Docket No. 95-03-01), June 19, 1995.  
Louisiana Public Service Commission (Docket No. U-17949, Subdocket E), July 24, 1995.  
California Public Utilities Commission (Investigation No. I.95-05-047), with R.L. Schmalensee and T.J. Tardiff, September 8, 1995. Reply September 18, 1995.  
Mississippi Public Service Commission (Docket No. 95-UA-313), October 13, 1995.  
Louisiana Public Service Commission (Docket No. U-20883), November 21, 1995.  
Federal Communications Commission (CC Docket No. 94-1), with T. Tardiff and C. Zarkadas, December 18, 1995. Reply March 1, 1996.  
North Carolina Utilities Commission (Docket No. P-7, Sub 825; P-10, Sub 479), February 9, 1996.  
Rhode Island Public Utilities Commission (Docket No. 2370), February 23, 1996. Rebuttal June 25, 1996.  
Pennsylvania Public Utility Commission (Docket No. P-00961024), April 15, 1996. Rebuttal July 19, 1996.  
Canadian Radio-Television and Telecommunications Commission, in response to CRTC Telecom Public Notice CRTC 96-8 (2 filings), June 10, 1996.  
Federal Communications Commission (CC Docket 96-262 et al.), *ex parte* March 1997.  
Federal Communications Commission (CC Docket Nos. 93-193, Phase 1, Part 2, 94-65), May 19, 1997.  
Vermont Public Service Board (Docket no. 6000), January 19, 1998.  
Colorado Public Utilities Commission (Docket No. 97A-540T, January 30, 1998. Rebuttal May 14, 1998.  
California Public Utilities Commission, affidavit on economic principles for updating Pacific Bell's price cap plan. Filed February 2, 1998.  
California Public Utilities Commission, reply comments on Pacific proposal to eliminate vestiges of ROR regulation and inflation minus productivity factor formula/index, filed June 19, 1998.  
Pennsylvania Public Utility Commission (Docket No. P-00981410), October 16, 1998.  
Rebuttal February 4, 1999.

Comisión Federal de Telecomunicaciones de México (“Cofotel”), “Economic Parameter Values in the Telmex Price Cap Plan,” arbitrator’s report regarding the renewal of the price cap plan for Telmex, February 15, 1999.

Kentucky Public Service Commission (Docket No. 98-292), April 5, 1999.

Federal Communications Commission (Docket Nos. 94-1, 96-26), January 7, 2000. Reply comments filed January 24, 2000, Ex parte comments filed May 5, 2000.

New Mexico Public Regulation Commission, direct testimony filed December 10, 1999.

Arizona Corporation Commission (Docket No. T-01051B-99-105), rebuttal filed August 21, 2000; rejoinder filed September 19, 2000.

Connecticut Department of Public Utilities (Docket No. 00-07-17), filed November 21, 2000.

Pennsylvania Public Utility Commission (Docket No. P-00981449), filed October 31, 2000. Rebuttal testimony filed February 20, 2001.

NERA Report: Economic Assessment of the Consumer Choice and Fair Competition Telecommunications Amendment (Proposition 108) (with Aniruddha Banerjee and Charles Zarkadas), November 2000.

Canadian Radio-Television and Telecommunications Commission, in response to CRTC Telecom Public Notice CRTC 2000-108, oral panel testimony, January 11, 2001.

Maine Public Utilities Commission (Docket No. 99-851, January 8, 2001. Rebuttal filed February 12, 2001.

Before the Massachusetts Department of Telecommunications and Energy, April 12, 2001. Rebuttal testimony September 21, 2001.

New York Public Service Commission, (Case 00-C-1945), May 15, 2001.

Canadian Radio-Television and Telecommunications Commission (Public Notice CRTC 2001-37), filed May 31, 2001, rebuttal evidence filed September 20, 2001.

The New Jersey Board of Public Utilities (Docket No. TO01020095), February 15, 2001. Rebuttal filed June 15, 2001. Supplemental rebuttal filed September 25, 2001.

Utah Public Service Commission, October 5, 2001. Rebuttal filed November 22, 2001.

New York Public Service Commission, (Case 00-C-1945), (panel testimony), filed February 11, 2002.

## **Payphone**

California Public Utilities Commission (Case 88-04-029), July 11, 1988.

Illinois Commerce Commission (Docket No. 88-0412), August 3, 1990. Surrebuttal December 9, 1991.

Michigan Public Service Commission (Case No. U-11756), October 9, 1998.

South Carolina Public Service Commission (Docket No. 97-124-C), December 7, 1998.

New Jersey Board of Public Utilities (OAL DOCKET Nos. PUCOT 11269-97N, PUCOT 11357-97N, PUCOT 01186-94N AND PUCOT 09917-98N), March 8, 1999. Surrebuttal June 21, 1999.

Louisiana Public Service Commission (Docket No. U-22632), July 17, 2000.

Tennessee Regulatory Authority, Docket No. 97-00409, October 6, 2000.

**Economic Costing and Pricing Principles**

Florida Public Service Commission (Docket No. 820400-TP), June 25, 1986.  
Delaware Public Service Commission (Docket No. 86-20, Phase II), March 31, 1989. Rebuttal November 17, 1989.  
Delaware Public Service Commission (Docket No. 89-24T), August 17, 1990.  
Florida Public Service Commission (Docket No. 900633-TL), May 9, 1991.  
Maryland Public Service Commission (Case No. 8584, Phase II), December 15, 1994.  
Additional direct testimony May 5, 1995. Rebuttal testimony filed June 30, 1995.  
Canadian Radio-Television and Telecommunications Commission, Response to Interrogatory SRCI(CRTC) 1Nov94-906, "Economies of Scope in Telecommunications," January 31, 1995.  
Pennsylvania Public Utility Commission (Docket Nos. A-310203F0002, A-310213F0002, A-310236F0002 and A-310258F0002), March 21, 1996.  
State of Connecticut, Department of Public Utility Control (DPUC Docket No. 95-06-17), July 23, 1996.  
New Jersey Board of Public Utilities (Docket No. TX95120631), August 15, 1996. Rebuttal filed August 30, 1996.  
Florida Public Service Commission (Docket No. 980000-SP), September 24, 1998.  
Nebraska Public Service Commission, (Application No. C-1628), October 20, 1998. Reply November 20, 1998.  
Florida Public Service Commission (Docket No. 980000-SP), November 13, 1998.  
Wyoming Public Service Commission (Docket No. 70000-TR-99), April 26, 1999.  
New Mexico Public Regulation Commission (Utility Case No. 3147), December 6, 1999, rebuttal testimony filed December 28, 1999.  
New Mexico Public Regulation Commission (Case No. 3008, rebuttal testimony filed May 19, 2000.  
North Dakota Public Service Commission, (Case No. PU-314-99-119), May 30, 2000.  
New Mexico Public Regulation Commission (Case No. 3225, direct testimony filed August 18, 2000. Rebuttal filed September 13, 2000.  
New Mexico Public Regulation Commission (Case No. 3300), rebuttal testimony filed October 19, 2000.  
Alabama Public Service Commission (Docket Nos. 15957 and 27989), direct testimony filed August 3, 2001. Rebuttal testimony filed August 13, 2001. Additional rebuttal testimony filed August 17, 2001.  
The New Jersey Board of Public Utilities (Docket No. TO01020095), February 15, 2001. Rebuttal filed June 15, 2001.

**Statistics**

Arizona State Air Pollution Control Hearing Board (Docket No. A-90-02), affidavit December 7, 1990.  
Expert testimony: Michigan Circuit Court (Case No. 87-709234-CE and 87-709232-CE), *Her Majesty the Queen, et al., v. Greater Detroit Resource Recovery Authority, et al.*, February, 1992.

Expert testimony: United States District Court, Eastern District of New York, *Jancyn Manufacturing Corp. v. The County of Suffolk*, January 11, 1994.

New York Public Service Commission (Case Nos. 93-C-0451 and 91-C-1249), July 23, 1996.

New York Public Service Commission (Cases 95-C-0657, 94-C-0095, 91-C-1174 and 96-C-0036): panel testimony, March 18, 1998. Rebuttal June 3, 1998.

### **InterLATA Toll Competition**

Canadian Radio-Television and Telecommunications Commission (Docket No. 1990-73), November 30, 1990.

Federal Communications Commission (Docket 91-141), August 6, 1991.

Federal Communications Commission (CC Docket 92-141), July 10, 1992.

Federal Communications Commission (In the Matter of Policy and Rules Concerning Rates for Competitive Common Carrier Services and Facilities Authorization Therefor) with A.E. Kahn, November 12, 1993.

U.S. District Court for the District of Columbia *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, Affidavit with A.E. Kahn, May 13, 1994.

U.S. Department of Justice, *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, August 25, 1994.

Federal Communications *ex parte* filing in CC Docket No. 94-1, March 16, 1995.

Federal Communications Commission (CC Docket No. 79-252) *ex parte* comments with J. Douglas Zona, April 1995.

U.S. Department of Justice in *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, regarding Telefonos de Mexico's provision of interexchange telecommunications services within the United States, affidavit May 22, 1995.

U.S. Department of Justice in *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, regarding provision of interexchange telecommunications services to customers with independent access to interexchange carriers, May 30, 1995.

Expert testimony: *US WATS v. AT&T*, Confidential Report, August 22, 1995. Testimony October 18-20, 25-27, 30, 1995. Rebuttal testimony December 4, December 11, 1995.

Expert testimony: United States District Court for the Northern District of Texas, Dallas Division, Civil Action 394CV-1088D, *Darren B. Swain, Inc. d/b/a U.S. Communications v. AT&T Corp.* Confidential Report, November 17, 1995.

U.S. District Court, Southern District of New York, *Multi Communications Media Inc., v. AT&T and Trevor Fischbach* (96 Civ. 2679 (MBM)), December 27, 1996.

Federal Communications Commission (CC Docket Nos. 96-262 and 96-45), March 18, 1998.

Subcommittee on Communications of the Senate Committee on Commerce, Science and Transportation, *Statement* and oral testimony regarding long distance competition and Section 271 of the Telecommunications Act of 1996, March 25, 1998.

Federal Communications Commission (CC Docket No. 96-262), with P.S. Brandon, October 16, 1998.

Federal Communications Commission (CC Docket No. 96-262) with P.S. Brandon, October 22, 1998.

### **IntraLATA Toll Competition**

New Jersey Board of Public Utilities (Docket No. TX90050349), December 6, 1990.  
New York Public Service Commission (Case No. 28425) with T.J. Tardiff, May 1, 1992.  
New Jersey Board of Regulatory Commissioners (Docket No. TX93060259), Affidavit October 1, 1993.  
New Jersey Board of Public Utilities (Docket Nos. TX90050349, TE92111047, TE93060211), April 7, 1994. Rebuttal April 25, 1994. Summary Affidavit and Technical Affidavit April 19, 1994.  
Delaware Public Utilities Commission (Docket No. 42), October 21, 1994.  
Pennsylvania Public Utility Commission (Docket No. I-940034), panel testimony, December 8, 1994. Reply February 23, 1995. Surrebuttal March 16, 1995.  
Public Service Commission of West Virginia (Case No. 94-1103-T-GI), March 24, 1995.  
New Jersey Board of Public Utilities (Docket No. TX94090388), April 17, 1995. Rebuttal May 31, 1995.  
New York Public Service Commission (Case 94-C-0017), August 1, 1995.  
Rhode Island Public Service Commission (Docket No. 2252), November 17, 1995.  
Massachusetts Department of Telecommunications and Energy (Docket No. 98-85), October 20, 1998.

### **Local Competition**

Massachusetts Department of Public Utilities (Docket No. D.P.U. 94-185), May 19, 1995. Rebuttal August 23, 1995.  
The Public Utilities Commission of Ohio (Case No. 94-1695-TP-ACE), May 24, 1995.  
Vermont Public Service Board (Open Network Architecture Docket No. 5713), June 7, 1995. Rebuttal July 12, 1995.  
New Jersey Board of Public Utilities (with Kenneth Gordon and Alfred E. Kahn), paper filed in connection with arbitration proceedings, August 9, 1996.  
Florida Public Service Commission, "Local Telecommunications Competition: An Evaluation of a Proposal by the Communications Staff of the Florida Public Service Commission," with A. Banerjee, filed November 21, 1997.  
Rhode Island Public Utilities Commission (Docket No. 2681), January 15, 1999.  
Connecticut Department of Public Utility Control (Docket No. 95-06-17RE02), June 8, 1999.  
CPR Institute for Dispute Resolution Arbitral Tribunal, Rebuttal Affidavit in arbitrations between BellSouth Telecommunications and Supra Telecommunications & Information Systems, November 5, 2001.

### **Interconnection**

Federal Communications Commission (Docket 91-141), September 20, 1991.  
Maryland Public Service Commission (Case No. 8584) with A.E. Kahn, November 19, 1993. Rebuttal January 10, 1994. Surrebuttal January 24, 1994.  
Maryland Public Service Commission (Case No. 8659), November 9, 1994.  
Federal Communications Commission (CC Docket No. 95-185), affidavit March 4, 1996.  
Federal Communications Commission (CC Docket No. 96-98), videotaped presentation on economic costs for interconnection, FCC Economic Open Forum, May 20, 1996.

### **Imputation**

New Hampshire Public Service Commission (Docket DE 90-002), May 1, 1992. Reply testimony July 10, 1992. Rebuttal testimony August 21, 1992.

Canadian Radio-Television and Telecommunications Commission (Telecom Public Notice CRTC 95-36), August 18, 1995.

Massachusetts Department of Public Utilities (Docket No. D.P.U./D.T.E. 94-185-C), Affidavit February 6, 1998. Reply Affidavit February 19, 1998.

New Jersey Board of Public Utilities (BPU Docket No. TO97100808, OAL Docket No. PUCOT 11326-97N), July 8, 1998. Rebuttal September 18, 1998.

Vermont Public Service Board (Docket No. 6077), November 4, 1998.

### **Economic Depreciation**

Florida Public Service Commission (Docket No. 920385-TL), September 3, 1992.

Louisiana Public Service Commission (Docket No. U-17949, Subdocket E), November 17, 1995. Surrebuttal, December 13, 1995, Further Surrebuttal, January 12, 1996.

Federal Communications Commission (CC Docket No. 98-137), with A. Banerjee, November 23, 1998.

### **Spectrum**

Federal Communications Commission (ET Docket 92-100) with Richard Schmalensee, November 9, 1992.

Federal Communications Commission (Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems, PR Docket No. 93-61), with R. Schmalensee, June 29, 1993.

### **Mergers**

U.S. District Court for the District of Columbia, *United States of America v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, with A.E. Kahn, January 14, 1994.

Vermont Public Service Board (Docket No. 5900), September 6, 1996.

Maine Public Utilities Commission (Docket No. 96-388), September 6, 1996. Rebuttal October 30, 1996.

New Hampshire Public Service Commission (Docket DE 96-220), October 10, 1996.

Federal Communications Commission (Tracking No. 96-0221), with Richard Schmalensee, October 23, 1996.

New York Public Service Commission (Case 96-C-0603), panel testimony, November 25, 1996. Reply December 12, 1996.

Federal Communications Commission (CC Docket No. 97-211), with R. Schmalensee, affidavit March 13, 1998. Reply affidavit May 26, 1998.

Connecticut Department of Public Utility Control, testimony regarding economic aspects of the SBC-SNET proposed change in control, filed June 1, 1998.

Federal Communications Commission (CC Docket No. 98-141), with R. Schmalensee, July 21, 1998. Reply November 11, 1998.

Alaskan Public Utilities Commission (Docket Nos. U-98-140/141/142 and U-98-173/174), February 2, 1999. Rebuttal March 24, 1999.

Pennsylvania Public Utility Commission (Docket Nos. A-310200F0002, A-311350F0002, A-310222F0002, A-310291F0003), April 22, 1999.

State Corporation Commission of Virginia, *In re: Joint Petition of Bell Atlantic Corporation and GTE Corporation for approval of agreement and plan of merger*, May 28, 1999.

Ohio Public Utility Commission (Docket No. 98-1398-TP-AMT), June 16, 1999.

Kentucky Public Service Commission (Docket No. 99-296), July 9, 1999.

Colorado Public Utilities Commission (Docket No. 99A-407T), December 7, 1999.

Iowa Utilities Board, rebuttal testimony, filed December 23, 1999.

Minnesota Public Utilities Commission (Docket No. P3009, 3052, 5096, 421, 3017/PA-99-1192), January 14, 2000.

Washington Utilities and Transportation Commission (Docket No. UT-991358), February 22, 2000.

Montana Public Service Commission (Docket No. D99.8.200), February 22, 2000.

Utah Public Service Commission (Docket No. 99-049-41), February 28, 2000.

Minnesota Public Utilities Commission (Docket No. P3009, 3052, 5096, 421, 3017/PA-99-1192), rebuttal affidavit filed January 14, 2000.

Minnesota Public Utilities Commission (Docket No. P3009, 3052, 5096, 421, 3017/PA-99-1192), direct testimony filed March 29, 2000.

Arizona Corporation Commission (Docket No. T-01051B-99-0497), rebuttal testimony filed April 3, 2000.

Wyoming Public Service Commission (Docket Nos. 74142-TA-99-16, 70000-TA-99-503, 74037-TA-99-8, 70034-TA-99-4, 74089-TA-99-9, 74029-TA-99-43, 74337-TA-99-2, Record No. 5134), rebuttal testimony filed April 4, 2000.

### **Broadband Services**

Federal Communications Commission (File Nos. W-P-C 6912 and 6966), August 5, 1994.

Federal Communications Commission (File Nos. W-P-C 6982 and 6983), September 21, 1994.

Federal Communications Commission, affidavit examining cost support for Asymmetric Digital Subscriber Loop (ADSL) video dialtone market trial, February 21, 1995.

Federal Communications Commission, affidavit examining cost support for Bell Atlantic's video dialtone tariff, March 6, 1995.

Federal Communications Commission (File Nos. W-P-C 7074), July 6, 1995.

U.S. District Court for the Eastern District of Virginia (Alexandria Division), *United States Telephone Association, et al., v. Federal Communications Commission, et al.* (Civil Action No. 95-533-A), with A.E. Kahn, affidavit October 30, 1995.

Federal Communications Commission (CC Docket No. 95-145), October 26, 1995.

Supplemental Affidavit December 21, 1995.

Expert testimony: *FreBon International Corp. vs. BA Corp. Civil Action*, No. 94-324 (GK), regarding Defendants' Amended Expert Disclosure Statement, filed under seal February 15, 1996.

Federal Communications Commission (CC Docket No. 96-46), *ex parte* affidavit, April 26, 1996.

Federal Communications Commission (CC Docket No. 96-112), affidavit filed May 31, 1996.  
Federal Communications Commission (CC Docket No. 96-112), affidavit June 12, 1996.  
Federal Communications Commission (CC Docket No. 96-46), July 5, 1996.  
Pennsylvania Public Utility Commission, "Promises Fulfilled; Bell Atlantic-Pennsylvania's Infrastructure Development," filed January 15, 1999 (with Charles J. Zarkadas, Agustin J. Ros, and Jaime C. d'Almeida).

### **Rate Rebalancing**

Canadian Radio-Television and Telecommunications Commission, Implementation of Regulatory Framework and Related Issues, Telecom Public Notices CRTC 94-52, 94-56 and 94-58, February 20, 1995.  
Pennsylvania Public Utility Commission (Docket No. R-00963550), April 26, 1996. Rebuttal July 5, 1996.  
Pennsylvania Public Utility Commission (Docket No. R-963550 C0006), August 30, 1996.  
Public Utilities Commission of Ohio (Case No. 96-899-TP-ALT), February 19, 1997.

### **Universal Service**

Louisiana Public Service Commission (Docket No. U-20883, Subdocket A), August 16, 1995.  
Tennessee Public Service Commission (Docket No. 95-02499), October 20, 1995. Rebuttal October 25, 1995. Supplementary direct October 30, 1995. Supplementary rebuttal November 3, 1995.  
Mississippi Public Service Commission (Docket No. 95-UA-358), January 17, 1996. Rebuttal February 28, 1996.  
Federal Communications Commission (CC Docket No. 96-45) with Kenneth Gordon, April 12, 1996.  
Federal Communications Commission (CC Docket No. 96-45) with Aniruddha Banerjee, August 9, 1996.  
Federal-State Joint Board (CC Docket No. 96-45), *Remarks on Proxy Cost Models*, videotape filed January 14, 1997.  
New Jersey Board of Public Utilities (Docket No. TX95120631), September 24, 1997. Rebuttal October 18, 1997.  
Pennsylvania Public Utility Commission (Docket No. I-00940035), October 22, 1997.  
Alabama Public Service Commission (Docket No. 25980), February 13, 1998.  
North Carolina Utilities Commission (Docket No. P-100, SUB 133g), February 16, 1998. Rebuttal April 13, 1998.  
Mississippi Public Service Commission (Docket No. 98-AD-035), February 23, 1998. Rebuttal March 6, 1998.  
Tennessee Regulatory Authority (Docket No. 97-00888), April 3, 1998. Rebuttal April 9, 1998.  
Florida Public Service Commission (Docket No. 980696-TP), September 2, 1998.  
Georgia Public Service Commission (Docket No. 5825-U), September 8, 2000.

**Classification of Services as Competitive**

Maryland Public Service Commission (Case No. 8462), October 2, 1992.  
State Corporation Commission of Virginia (Case No. PUC 950067), January 11, 1996.  
Maryland Public Service Commission (Case No. 8715), March 14, 1996. Surrebuttal filed April 1, 1996.  
Federal Communications Commission (File No. SCL-97-003), December 8, 1997.  
Pennsylvania Public Utility Commission (Docket No. P-00971307, February 11, 1998. Rebuttal February 18, 1998.  
State of Connecticut, Department of Public Utility Control (Docket No. 98-02-33), February 27, 1998.  
The New Jersey Board of Public Utilities (Docket No. TO 99120934), May 18, 2000.  
Washington Transportation and Utilities Commission, (Docket No. UT-000883). October 6, 2000.  
New York Public Service Commission, (Case 00-C-1945), May 15, 2001.  
The New Jersey Board of Public Utilities (Docket No. TO01020095), February 15, 2001. Rebuttal filed June 15, 2001.

**Costing and Pricing Resold Services and Network Elements**

Science, Technology and Energy Committee of the New Hampshire House of Representatives, "An Economic Perspective on New Hampshire Senate Bill 77," April 6, 1993.  
Tennessee Public Service Commission (Docket No. 96-00067), May 24, 1996. Refiled with the Tennessee Regulatory Authority (Docket No. 96-00067), August 23, 1996.  
New York Public Service Commission (Case Nos. 95-C-0657, 94-C-0095, 91-C-1174), May 31, 1996. Additional testimony June 4, 1996. Rebuttal July 15, 1996.  
Louisiana Public Service Commission (Docket No. U-U-22020), August 30 1996. Rebuttal September 13, 1996.  
Tennessee Regulatory Authority (Docket No. 96-01331), September 10, 1996. Rebuttal September 20, 1996.  
New Jersey Board of Public Utilities (Docket No. TO96070519), September 18, 1996.  
Pennsylvania Public Utility Commission (Docket No. A-310258F0002), September 23, 1996.  
Massachusetts Department of Public Utilities (Docket Nos. D.P.U. 96-73/74, 96-75, 96-80/81, 96-83, 96-94), September 27, 1996. Rebuttal October 16, 1996.  
New Jersey Board of Public Utilities (Docket No. TX95120631), September 27, 1996.  
New Hampshire Public Service Commission (Docket DE 96-252), October 1, 1996.  
Massachusetts Department of Public Utilities (Docket Nos. D.P.U. 96-73/74, 96-75, 96-80/81, 96-83, 96-94), October 11, 1996. Rebuttal October 30, 1996.  
Federal Communications Commission (CC Docket No. 96-45), October 15, 1996.  
New Hampshire Public Service Commission (Docket DE 96-252), October 23, 1996.  
New Jersey Board of Public Utilities (Docket No. T096080621), November 7, 1996.  
Alabama Public Service Commission (Docket No. 25677), November 26, 1996.  
Delaware Public Utilities Commission, testimony re costs and pricing of interconnection and network elements, December 16, 1996. Rebuttal February 11, 1997.  
State Corporation Commission of Virginia, (Case No. PUC960), December 20, 1996. Rebuttal June 10, 1997 (Case No. PUC970005).

Public Service Commission of Maryland (Case No. 8731-II), January 10, 1997. Rebuttal April 4, 1997.

Public Service Commission of the District of Columbia (Case No. 962), January 17, 1997. Rebuttal May 2, 1997.

Connecticut Department of Public Utilities (DPUC Docket No. 96-09-22), January 24, 1997.

Connecticut Department of Public Utilities (DPUC Docket No. 96-11-03), February 11, 1997.

Federal Communications Commission, response to FCC Staff Report on issues regarding Proxy Cost Models. Filed February 13, 1997.

Public Service Commission of West Virginia (Case Nos. 96-1516-T-PC, 96-1561-T-PC, 96-1009-T-PC, and 96-1533-T-T), February 13, 1997. Rebuttal February 20, 1997.

Public Utilities Commission of Ohio (Case No. 97-152-TP-ARB), April 2, 1997.

Maine Public Utilities Commission (Docket No. 97-505), April 21, 1997. Rebuttal October 21, 1997.

Vermont Public Service Board (Docket No. 5713), July 31, 1997. Rebuttal January 9, 1998. Surrebuttal February 26, 1998. Supplemental rebuttal March 4, 1998.

State of Connecticut, Department of Public Utility Control (Docket Nos. 95-03-01, 95-06-17 and 96-09-22), August 29, 1997. Rebuttal December 17, 1998.

Alabama Public Service Commission (Docket No. 26029), September 12, 1997.

Tennessee Regulatory Authority (Docket No. 97-01262), October 17, 1997.

South Carolina Public Service Commission (Docket No. 97-374-C), November 25, 1997.

Rhode Island Public Utilities Commission, direct testimony re costing and pricing principles for interconnection and unbundled network elements filed November 25, 1997.

North Carolina Utilities Commission (Docket No. P-100, SUB 133d), December 15, 1997. Rebuttal March 9, 1998.

Massachusetts Department of Public Utilities (Docket No. DTE 98-15), January 16, 1998.

Mississippi Public Service Commission (Docket No. 97-AD-544, March 13, 1998.

New Hampshire Public Service Commission (Docket No. 97-171, Phase II), March 13, 1998. Rebuttal April 17, 1998.

Massachusetts Department of Telecommunications and Energy (D.P.U. 96-3/74, 96-75, 96-80/81, 96-83, & 96-94), April 29, 1998.

Massachusetts Department of Telecommunications and Energy (Docket No. 85-15, Phase III, Part 1), August 31, 1998.

Massachusetts Department of Telecommunications and Energy (Docket No. 98-15, Phase II), September 8, 1998.

Rhode Island Public Utilities Commission (Docket No. 2681), September 18, 1998.

Maryland Public Service Commission (Case No. 8786), November 16, 1998.

New Hampshire Public Utilities Commission (Docket No. 99-018), April 7, 1999. Rebuttal April 23, 1999.

Massachusetts Department of Telecommunications & Energy (Docket No. 94-185-E), July 26, 1999.

New York Public Service Commission, (Case 98-C-1357), February 7, 2000. Panel Rebuttal Testimony filed October 19, 2000.

The New Jersey Board of Public Utilities (Docket No. TO00060356), July 28, 2000.

Massachusetts Department of Telecommunications and Energy (Docket DTE -1-20), direct testimony filed May 4, 2001.

The Public Service Commission of Maryland (Case No. 8879), May 25, 2001, rebuttal September 5, 2001. Surrebuttal October 15, 2001.  
Public Service Commission of the District of Columbia (Case No. 962), July 16, 2001.

**Bell Entry into InterLATA Markets**

Federal Communications Commission (CC Docket No. 96-149), affidavit, August 15, 1996.  
Federal Communications Commission (Docket No. 96-149) with Paul B. Vasington, November 14, 1996.  
Georgia Public Service Commission (Docket No. 6863-U), January 3, 1997. Rebuttal February 24, 1997.  
Pennsylvania Public Utility Commission, statement regarding costs and benefits from Bell Atlantic entry into interLATA telecommunications markets, February 10, 1997. Rebuttal March 21, 1997.  
New York Public Service Commission, "Competitive Effects of Allowing NYNEX To Provide InterLATA Services Originating in New York State," with Harold Ware and Richard Schmalensee, February 18, 1997.  
Delaware Public Utilities Commission, statement regarding costs and benefits from Bell Atlantic entry into interLATA telecommunications markets, filed February 26, 1997. Rebuttal April 28, 1997.  
New Jersey Board of Public Utilities (Docket No. T097030166), March 3, 1997. Reply May 15, 1997.  
Federal Communications Commission (CC Docket 96-262 *et al.*), with Richard Schmalensee, Doug Zona and Paul Hinton, *ex parte* March 7, 1997.  
Public Service Commission of Maryland, statement regarding consumer benefits from Bell Atlantic's provision of interLATA service, filed March 14, 1997.  
Louisiana Public Service Commission, (Docket No. U-22252), March 14, 1997. Rebuttal May 2, 1997. Supplemental testimony May 27, 1997.  
Public Service Commission of West Virginia, economic analysis of issues regarding Bell Atlantic's entry into the interLATA long distance market. Filed March 31, 1997.  
South Carolina Public Service Commission (Docket No. 97-101-C), April 1, 1997. Rebuttal June 30, 1997.  
Kentucky Public Service Commission (Administrative Case No. 96-608), April 14, 1997. Rebuttal April 28, 1997. Supplemental rebuttal August 15, 1997.  
Federal Communications Commission (CC Docket No. 96-149), April 17, 1997.  
Maine Public Utilities Commission, affidavit regarding competitive effects of NYNEX entry into interLATA markets, with Kenneth Gordon, Richard Schmalensee and Harold Ware, filed May 27, 1997.  
Alabama Public Service Commission (Docket No. 25835), June 18, 1997. Rebuttal August 8, 1997.  
North Carolina Utilities Commission (Docket No. P-55, Sub1022), August 5, 1997. Rebuttal September 15, 1997.  
Mississippi Public Service Commission (Docket No. 97-AD-0321), July 1, 1997. Rebuttal September 29, 1997.  
Federal Communications Commission, CC Docket No. 99-295. Filed September 29, 1999.

Federal Communications Commission, *In the Matter of Application by Verizon New England Inc., et. al. for Authorization to Provide In-Region, InterLATA Services in Massachusetts*, September 19, 2000, Reply Declaration filed November 3, 2000. Supplemental Reply Declaration filed February 28, 2001.

Pennsylvania Public Utility Commission, (Docket No. M-00001435), January 8, 2001.

Federal Communications Commission, *In the Matter of Application by Verizon New England Inc., et. al. for Authorization to Provide In-Region, InterLATA Services in Connecticut*, May 24, 2001.

Federal Communications Commission, *In the Matter of Application by Verizon Pennsylvania Inc., et. al. for Authorization to Provide In-Region, InterLATA Services in Pennsylvania*, June 21, 2001.

Alabama Public Service Commission (Docket No. 25835), June 19, 2001.

Louisiana Public Service Commission (Docket No. U-22252-E), reply affidavit filed June 25, 2001.

South Carolina Public Service Commission (Docket No. 2001-209-C), July 16, 2001.

Alabama Public Service Commission (Docket No. 25835), rebuttal testimony filed June 19, 2001.

Kentucky Public Service Commission (Docket No. 2001-105), July 30, 2001.

Mississippi Public Service Commission (Docket No. 97-AD-321), August 2, 2001.

Florida Public Service Commission (Docket No. 960786-TL, August 20, 2001.

North Carolina Utilities Commission (Docket No. P-55, SUB 1022), October 8, 2001.

Federal Communications Commission (CC Docket No. 01-277), (Georgia-Louisiana) November 13, 2001.

Minnesota Public Utilities Commission (PUC Docket No. P-421/C1-01-1372, OAH Docket No. 7-2500-14487-2) affidavit filed December 28, 2001, Surrebuttal Affidavit filed January 16, 2002.

### **Regulatory Reform**

Federal Communications Commission (CC Docket No. 80-286), December 10, 1997.

Federal Communications Commission, *In the Matter of United States Telephone Association Petition for Rulemaking—1998 Biennial Regulatory Review*, with Robert W. Hahn, filed September 30, 1998.

### **Reciprocal Compensation**

Massachusetts Department of Telecommunications and Energy (Docket No. 98-67), September 25, 1998.

Washington Public Utilities Commission (Docket No. UT-990300), February 24, 1999. Rebuttal March 8, 1999.

Colorado Public Utilities Commission (Docket No. 99A-001T), March 15, 1999.

Massachusetts Department of Telecommunications and Energy (Docket No. D.T.E. 97-116-B), March 29, 1999.

North Carolina Utilities Commission (Docket No. P-500, Sub 10), July 9, 1999.

North Carolina Utilities Commission (Docket No. P-561, Sub 10), July 30, 1999.

Public Service Commission of South Carolina (Docket No. 1999-259-C), August 25, 1999.

Louisiana Public Service Commission (Docket No. U-24206), September 3, 1999.

Florida Public Service Commission (Docket No. 990750-TP), September 13, 1999.  
New Mexico Public Regulation Commission (Case No. 3131), October 13, 1999.  
Alabama Public Service Commission (Docket No. 27091), October 14, 1999.  
Tennessee Regulatory Authority (Docket No. 99-00377), October 15, 1999.  
Tennessee Regulatory Authority (Docket No. 99-00430), October 15, 1999.  
Mississippi Arbitration Panel (Docket No. 99-AD421), October 20, 1999.  
Kentucky Public Service Commission (Case No. 99-218), October 21, 1999.  
Georgia Public Service Commission (Docket No. 10767-U), October 25, 1999.  
Oregon Public Utility Commission (Arb. 154), November 5, 1999.  
Federal Communications Commission (Docket No. 99-68), "An Economic and Policy Analysis of Efficient Intercarrier Compensation Mechanisms for Internet-Bound Traffic," *ex parte*, November 12, 1999 (with A. Banerjee and A. Ros). Reply Comments: "Efficient Inter-Carrier Compensation for Internet-Bound Traffic," (with A. Banerjee), October 23, 2000.  
Georgia Public Service Commission (Docket No. 10854-U), November 15, 1999, rebuttal testimony filed November 22, 1999.  
Idaho Public Utilities Commission (Docket No. GST-T-99-1), November 22, 1999, rebuttal testimony filed December 2, 1999.  
Texas Public Utility Commission (Docket No. 21982), March 15, 2000, rebuttal testimony filed March 31, 2000.  
Arizona Corporation Commission (Docket Nos. T-02432B-00-0026, T-01051B-00-0026), March 27, 2000, rebuttal testimony filed April 3, 2000.  
Colorado Public Utilities Commission (Docket No. 00B-011T), direct testimony filed March 28, 2000.  
Pennsylvania Public Utility Commission (Docket No. A-310620F0002), April 14, 2000, rebuttal testimony filed April 21, 2000.  
Delaware Public Service Commission (PSC Docket No. 00-205), filed April 25, 2000.  
Virginia State Corporation Commission, filed April 25, 2000.  
The New Jersey Board of Public Utilities (Docket No. TO 00031063) Direct testimony filed April 28, 2000, rebuttal testimony filed May 5, 2000.  
Washington Utilities and Transportation Commission (Docket No. UT-003006). Filed April 26, 2000. Rebuttal testimony filed May 10, 2000. Surrebuttal testimony filed May 26, 2000.  
The New Jersey Board of Public Utilities (Docket No. TO 00031063). Filed April 28, 2000. Rebuttal testimony filed May 5, 2000.  
Federal Communications Commission, (CC Docket Nos. 96-98, 95-185, WT Docket No. 97-207), "Reciprocal Compensation for CMRS Providers," June 13, 2000 (with Charles Jackson).  
Colorado Public Utilities Commission (Docket No. 00B-103T), June 19, 2000.  
Federal Communications Commission, *In the Matter the Remand of the Commission's Reciprocal Compensation Declaratory Ruling by the U.S. Court of Appeals for the D.C. Circuit* (CC Docket Nos. 96-98, 99-68), July 21, 2000. Reply August 4, 2000.  
Montana Department of Public Service Regulation (Docket No. D2000.6.89), July 24, 2000. Rebuttal filed February 7, 2001.  
Washington Utilities and Transportation Commission (Docket 003013 Part B), filed August 4, 2000. Rebuttal filed February 7, 2001.  
Nebraska Public Service Commission, (Docket No. C-2328), September 25, 2000. Rebuttal testimony filed October 4, 2000.

Montana Department of Public Service Regulation (Docket No. D2000.8.124: TouchAmerica Arbitration), October 20, 2000. Rebuttal filed December 20, 2000.  
Arizona Corporation Commission (Docket Nos. T-03654A-00-0882,T-01051B-00-0882), January 8, 2001.  
Florida Public Service Commission (Docket No. 000075-TP), filed January 10, 2001.  
Colorado Public Utilities Commission (Docket No. 00B-601T), filed January 16, 2001.  
Utah Public Service Commission (Docket No. 00-999-05), filed February 2, 2001. Rebuttal testimony filed March 9, 2001.  
Arizona Corporation Commission (Docket No. T-00000A-00-0194, Phase 2), March 15, 2001.  
Florida Public Service Commission (Docket No. 000075-TP), filed April 12, 2001.  
Federal Communications Commission (CC Docket No. 01-92), with Aniruddha Banerjee, filed November 5, 2001.

### **Contract Services**

Superior Court Department of the Trial Court (Civil Action No. 95-6363F), affidavit, July 1996.  
Connecticut Department of Public Utilities (Docket No. 99-03-17), June 18, 1999.  
American Arbitration Association, New York, *MCI WorldCom Communications Inc. v .Electronic Data Systems, Corporation*, Expert Report June 25, 2001. Supplemental Expert Report July 13, 2001.

### **Service Quality Performance Plans**

Georgia Public Service Commission (Docket No. 7892-U), June 27, 2000.  
Florida Public Service Commission (Docket No. 000121-TP), March 1, 2001. Rebuttal filed March 21, 2001. Rebuttal in Phase II filed April 19, 2001.  
North Carolina Utilities Commission (Docket No. P-100 Sub 133k), May 21, 2001.  
South Carolina Public Service Commission (Docket No. 2001-209-C), July 16, 2001.  
Kentucky Public Service Commission (Docket No. 2001-105), July 30, 2001. Surrebuttal September 10, 2001.  
Mississippi Public Service Commission (Docket No. 97-AD-321), August 2, 2001.  
Tennessee Regulatory Authority, (Docket No. 01-00193), August 10, 2001.

### **Miscellaneous**

New Mexico Public Regulation Commission (Utility Case No. 3147), December 6, 1999.  
New Mexico Public Regulation Commission (Utility Case No. 3008), May 19, 2000.  
United States District Court, District of Nevada (Case No. CV-S-99-1796-KJD(RJJ), December 28, 2000.

April, 2002

## **HAROLD WARE**

### **BUSINESS ADDRESS**

National Economic Research Associates, Inc.  
50 Main Street  
White Plains, New York 10606  
(914) 448-4160  
Email: harold.ware@nera.com

Dr. Ware is currently Vice President, National Economic Research Associates, Inc. Dr. Ware received a B.A. *cum laude* in Economics from the State University of New York at Stony Brook, an M.S. in Mathematics Education from Yeshiva University, and M.A. and Ph.D. degrees in Economics from Cornell University.

At NERA, Dr. Ware has prepared testimony and conducted studies in antitrust cases and regulatory proceedings involving firms in a variety of industries. Much of his research has focused on telecommunications. Dr. Ware's recent work includes: analyses of emerging wireless and broadband alternatives to traditional telecommunications services; a detailed study of local competition and the desirability of reduced regulation; an international study of the indirect costs of telecommunications regulation; analysis and advice to counsel regarding payphone service competition; an analysis of the relevant market for business telecommunications services; analyses of the competitive and regulatory implications of the Telecommunications Act of 1996 and of appropriate federal universal service policies under the Act; analyses of the competitive effects of mergers on long distance service markets and wireless telecommunications markets and between telephone and cable TV companies; studies of regulatory treatment of stranded investment and appropriate depreciation policy in increasingly competitive markets; studies of demand and competition in the interexchange toll, local access, Centrex and private line markets; analyses and testimony on the planning and deployment of new electronic technology; a comparative econometric analysis of marketing costs; research on the benefits and costs of marketing; a study of the resale of cellular telephone service; and an analysis of competition in the PBX market and of damages in a PBX dealer termination case.

Dr. Ware has also studied: pricing policy regulation, competition, and demand for postal services, the impact of postal rate changes on the catalog marketing industry, the cost of fixed and mobile communications services, the cost of unserved demand for electricity, customer choice of interruptible rates, and the costs and benefits of time of day pricing for electricity. Dr. Ware's work on cases involving unregulated markets has included analyses of: the economic impacts of price discrimination and related practices; economic damages issues; and supply and demand substitutability in connection with predatory pricing.

While pursuing his graduate studies at Cornell University, Dr. Ware taught courses in economics and industrial organization and did research on cellular mobile communications in the Technology Assessment Project of the Program on Science, Technology and Society. He was co-author of three chapters in the resulting book, *Communications for a Mobile Society: An Assessment of New Technology*.

**EDUCATION:**

CORNELL UNIVERSITY  
Ph.D., Economics, 1978

CORNELL UNIVERSITY  
M.A., Economics, 1976

YESHIVA UNIVERSITY  
M.S., Mathematics Education, 1974

STATE UNIVERSITY OF NEW YORK AT STONY BROOK  
B.A. *cum laude*, Economics, 1969

**EMPLOYMENT:**

NATIONAL ECONOMIC RESEARCH ASSOCIATES, INC.

1997- Vice President. Dr. Ware has conducted studies and prepared testimony for regulatory proceedings and antitrust cases in a variety of industries. Much of Dr. Ware's research has focused on telecommunications, including: studies of appropriate regulatory pricing and depreciation policies in competitive markets; studies of demand and competition in the local, toll, Centrex/PBX and private line markets; analyses of the planning and deployment of new electronic technology in telecommunications networks; a comparative econometric analysis of marketing costs; research on the benefits and costs of marketing; a study of two-way mobile radio use in trucking; consulting on incremental cost studies; a comparison of the costs of cellular and wireline telephone service; studies of the costs, capacity and demand for alternative access options; studies of residential demand for telephone service; an extensive study of innovative performance; and analyses of testimony and regulatory filings concerning access pricing, cross-subsidization and other pricing issues. Dr. Ware has also studied: the economics of postal pricing and catalog marketing, the cost of unserved electricity, customer choice of interruptible rates, and the costs and benefits of time of day pricing for electricity.

Dr. Ware's work on cases involving unregulated markets has included analyses of: competition in the PBX market and of damages in a PBX dealer termination case; the economic impacts of price discrimination and related practices; economic damages issues; and supply and demand substitutability in connection with predatory pricing.

1984-1997 Senior Consultant

1978-1983 Senior Economic Analyst

1977-1978 Economic Analyst

CORNELL UNIVERSITY

- 1975-1977 Researcher, Program on Science, Technology and Society Dr. Ware participated as an economist in a multidisciplinary assessment of an emerging technology--cellular mobile radio. He co-authored and edited three chapters in the resulting book dealing with the costs, benefits and appropriate regulatory structure of the cellular industry.
- 1976 Instructor, Industrial Organization, Economics 351/551 (Summer).
- 1974-1977 Teaching Assistant, Microeconomics/Macroeconomics

MOUNT VERNON HIGH SCHOOL

- 1969-1974 Mathematics Teacher

STATE UNIVERSITY OF NEW YORK AT STONY BROOK

- 1966-1969 Research Assistant, Department of Economics

**PROFESSIONAL ACTIVITIES:**

The American Economic Association

President of the Stony Brook Chapter of the National Economics Honor Society,  
September 1968 - June 1969 (Vice President, September 1967 - June 1968)

**TESTIMONY:**

*Ex parte* Presentation to Federal Communications Commission staff members, on behalf of Bell Atlantic, regarding the Hybrid Cost Proxy Model, September 9, 1999.

Affidavit (with C. Dippon) in the matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECs, Before the Federal Communications Commission, Washington, DC, July 23, 1999.

Rebuttal Affidavit (with R. Schmalensee and P. Brandon) in the matter of the Application of Southwestern Bell Telephone Company Seeking Verification That It Has Fully Complied With And Satisfied the Requirements of § 271 (c) of the Telecommunications Act of 1996, Before the Arkansas Public Service Commission, June 12, 1998.

Affidavit, "Analysis of Hybrid Cost Proxy Model" Attachment 1 to the "Comments of Bell Atlantic on Hybrid Cost Proxy Model," in the matter of Federal-State Joint Board on Universal Service, Forward-Looking Mechanism for High Cost Support for Non-Rural LECS, CC Docket No. 96-45 and CC Docket No. 97-160, before the Federal Communications Commission, November 25, 1997.

Affidavit (with K. Gordon, R. Schmalensee and W. Taylor) in the matter of Application for NYNEX Corporation for Authority to Provide In-Region, InterLATA Service in the State of Maine, Before the Federal Communications Commission, Washington, DC, May 1997.

Affidavit (with R. Schmalensee and W. Taylor) in the matter of Application for NYNEX Corporation for Authority to Provide In-Region, InterLATA Service in the State of New York, Before the Federal Communications Commission, Washington, DC, February 1997.

Affidavit (with R. Schmalensee) in the matter of Application for NYNEX Corporation for Authority to Provide In-Region, InterLATA Service in the State of New York, Response to Department of Justice Request for Comments on Section 271 Standard, Washington, DC, December 13, 1996.

Rebuttal Testimony presenting the results of a study of third-class mailers (primarily mailers of catalogs) to determine the economic impacts of various postal rate proposals, before the Postal Rate Commission, Washington, DC, Docket No. R94-1, on behalf of Direct Marketing Association, Inc., September 7, 1994.

Affidavit (with R. Rozek) in the matter of *U.S. vs. Western Electric Co. and American Telephone and Telegraph Company*, U.S. District Court for the District of Columbia, Civil Action No. 82-0192-HHG, supporting "BellSouth Corporation's Reply to the Memorandum of the United States in Response to the Bell Companies' Motion for Generic Wireless Waivers," filed September 2, 1994.

Affidavit (with R. Rozek) in the matter of *U.S. vs. Western Electric Co. and American Telephone and Telegraph Company*, U.S. District Court for the District of Columbia, Civil Action No. 82-0192-HHG, supporting "BellSouth Corporation's Opposition to AT&T's Motion for a Waiver of Section I(D) of the Decree Insofar as it Bars the Proposed AT&T-McCaw Merger," filed June 28, 1994.

Affidavit (with R. Rozek) on behalf of BellSouth Corporation before the Federal Communications Commission in the matter of *AT&T-McCaw Merger, In re Applications of American Telephone and Telegraph Company and Craig O. McCaw For Consent to the Transfer of Control of McCaw Cellular Communications, Inc. and its Subsidiaries*, File No. ENF-93-44, filed June 20, 1994.

Surrebuttal Testimony regarding how Contel has conducted its investment planning studies, forecast accuracy and the role of unquantified benefits of new technology in investment decision making, before the Missouri Public Service Commission, Case No. TR-89-196, on behalf of Contel of Missouri, Inc., December 29, 1989.

Affidavit in the matter of *United States v. Western Electric Company, Inc. and American Telephone and Telegraph Company*, U.S. District Court for the District of Columbia, Civil Action No. 81-0192-HHG, supporting the "Request of NYNEX

Corporation for a Waiver to Provide International Telecommunications to and from the United States," filed April 29, 1988.

Rebuttal Testimony regarding Planning and Deployment of Digital Technology, before the Minnesota Public utilities Commission, Docket No. P412/CI-86-354, on behalf of Northwestern Bell Telephone Company, October 5, 1987.

Direct Testimony regarding Residential Demand for Telephone Service before the New York Public Service on behalf of Continental Telephone Company of New York, Inc., November 1984

**SPEECHES, PAPERS AND REPORTS:**

"Costs of Telecommunications Competition Policies," (with Nigel Attenborough, Timothy Tardiff and Agustin Ros) an Assessment of the Indirect Costs of Regulation in the US, UK and Other Countries, Prepared for Telecommunications New Zealand, May 9, 2000.

Analysis of Competition for Local Residence, Business and Carrier Access Services in New Jersey (Confidential) Prepared for Bell Atlantic-New Jersey, March 2000.

"Bundled Services and BOC Entry into Long Distance Service," presented at Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries; Rutgers, Newark, New Jersey, January 7, 2000.

"Still Not Ready for Prime Time: An Assessment of Initial Results from HCPM 2, HM 5.0 and BCPM 3.0," Prepared for Bell Atlantic, January 15, 1998.

"Diversification Trends in Telecommunications: Regulatory, Technological and Market Pressures," presented at the Institute for International Research Conference on "Successfully Developing Alternative Products & Services in the Utilities Industry," New Orleans, Louisiana, November 19, 1996.

"Competition and Rate Restructuring for Postal Services," presented at the Fourth Bi-Annual Conference on Postal and Delivery Economics: Managing Change in the Postal and Delivery Industries, sponsored by the Rutgers University Center for Research in Regulated Industries, Monterey California, May 24, 1996.

"Competition, Stranded Investment and Rate Rebalancing in Telecommunications," presented at the National Association of Regulatory Utility Commissioners 107th Annual Convention and Regulatory Symposium, New Orleans, Louisiana, November 13, 1995.

(Moderator for) "Competition and Regulation" Twenty-second Annual Telecommunications Policy Research Conference, Solomon, Maryland, October 3, 1994.

"Effects of IntraLATA Toll Competition on Local Residence Rates," (Confidential Report) Prepared for Bell Atlantic-New Jersey, May 1994.

"Recovery and Avoidance of Stranded Investment in Telecommunications," Prepared for New England Power Service Company, Westborough, Massachusetts, March 10, 1994.

"The Effects of IntraLATA Competition and Presubscription on the Residence and Small Business Markets in New Jersey," (Confidential Report) Prepared for Bell Atlantic-New Jersey, December 1993.

"A Study of Demand for Optional New York Telephone Residence Services," Prepared for New York Telephone Company and Telesector Resources Group, Inc., August, 1993.

"Gaining Postal Rate Commission Acceptance of Demand-Based Pricing," presented to Government Affairs Committee of the Direct Marketing Association, Washington, DC, December 15, 1992.

"NERA Ordered Logit Analysis of Centrex and Private Line Service," prepared for New York Telephone Company, May 18, 1990.

"Regulatory, Technological and Strategic Determinants of Centrex Demand," Bellcore and Bell Canada Industry Forum on Telecommunications Demand Analysis with Dynamic Regulation, Hilton Head, South Carolina, April 24, 1990.

"Impacts of Deregulation and Competition on the PBX/Centrex Market", Seventeenth Annual Telecommunications Policy Research Conference, Airlie House, Airlie, VA, October 2, 1989.

"Regulatory Scrutiny of Marketing Expenses: Competitive Necessity vs. Regulatory Hang Ups," NERA Telecommunications Seminar, Scottsdale, Arizona, April 12-14, 1989.

"Competition in Telecommunications for Large Users in New York," NERA Telecommunications Seminar, Scottsdale, Arizona, April 12-14, 1989.

"New Directions In Telecommunications Planning" (Confidential) April, 1989.

"Telecommunications Competition For Large Business Customers in New York, A Summary of Research on Competitive Alternatives to New York Telephone Exchange Access and Private Line Service" (Confidential) June 25, 1987.

"Assessing the Competitive Potential of Regulated Markets," *Telecommunications in A Competitive Environment*, (proceedings of NERA conference held at Camelback Inn, Scottsdale, Arizona), March 4-7, 1987.

"The Bypass Question: Can We Find A Better Answer?," NERA  
Telecommunications Seminar, The Wigwam, Litchfield Park, Arizona, January 24-  
26, 1985.

**PUBLICATIONS:**

"Competition and Diversification Trends in Telecommunications: Regulatory, Technological and Market Pressures," *Journal of Regulatory Economics*, Published by Kluwer Academic Publishers, March 1998.

"Competition and Rate Restructuring For Postal Services" *Managing Change in the Postal and Delivery Industries*, Crew & Kleindorfer, ed., Published by Kluwer Academic Publishers, January 1997.

"The Competitive Potential of Cellular Mobile Telecommunications," *Public Utilities Fortnightly*, February 1983. Reprinted in *IEEE Communications*, November 1983.

"The Cost of Systems at 900 MHZ" (Chapter 4)

"Quantification of Some Benefits of Mobile Communications" (Chapter 10)

"The Emerging Mobile Communications Industry: Structure and Regulation" (Chapter 14) in *Communications for a Mobile Society: An Assessment of New Technology*, Raymond Bowers, ed., (Beverly Hills/London: Sage Publications, 1978).

"Market Structure and Spectrum Considerations in the Land Mobile Communications Industry," Fifth Annual Telecommunications Policy Conference, Airlie, Virginia March 30 - April 2, 1977, Vol. I, Federal Communications Commission (Washington, D.C.: National Technical Information Service, 1977).

"The Impact of Technological Change on Regulation: The Emerging Land Mobile Communications Industry," August 1977, Doctoral Dissertation, Cornell University.

May 2000

**Despite their growing recognition that DA is competitive,  
many states retain regulatory constraints on ILEC DA prices.**

State (a)	Company (b)	Regulatory Status (c)	Date Classified as Competitive Month/Year (d)	Call Allowance (e) (f)		Price per Call (g) (h)		Average Price per Call (i) (j)	
			Res	Bus	Res	Bus	Res <sup>1</sup>	Bus <sup>2</sup>	
1 Alabama	BellSouth	Regulated/ Pricing Flexibility	September-95	0	0	\$ 0.95	\$ 0.95	\$ 0.95	\$ 0.95
2 Arizona	Qwest	Competitive	June-99	1	1	1.11	1.11	0.54	0.54
3 Arkansas	SBC			0	0	1.25	1.25	1.25	1.25
4 California	SBC	Regulated		3	0	0.46	0.46	(0.25)	0.46
5 Colorado	Qwest	Deregulated	April-00	0	0	1.25	1.25	1.25	1.25
6 Connecticut	Verizon	Regulated		2	0	0.40	0.40	(0.01)	0.40
7 Delaware	Verizon	Competitive / Pricing Flexibility	October-99	0	0	0.75	0.75	0.75	0.75
8 Florida	BellSouth	Regulated/ Pricing Flexibility	January-96	0	0	0.36	0.36	0.36	0.36
9 Georgia	BellSouth	Regulated/ Pricing Flexibility	August-95	0	0	0.95	0.95	0.95	0.95
10 Hawaii	Verizon			10	10	0.20	0.20	(0.83)	(0.83)
11 Idaho (Southern)	Qwest	Deregulated	April-89	0	0	1.25	1.25	1.25	1.25
12 Idaho (Northern)	Qwest	Regulated		1	1	0.35	0.35	0.17	0.17
13 Illinois	SBC	Competitive / Pricing Flexibility	June-05	0	0	0.95	0.95	0.95	0.95
14 Indiana	SBC	Competitive / Pricing Flexibility	May-01	2	2	0.85	0.85	(0.02)	(0.02)
15 Iowa	Qwest	Deregulated	February-01	0	0	1.25	1.25	1.25	1.25
16 Kansas	SBC	Deregulated	June-01	0	0	0.75	0.75	0.75	0.75
17 Kentucky	BellSouth	Regulated / Pricing Flexibility	July-00	0	0	0.95	0.95	0.95	0.95
18 Louisiana	BellSouth	Regulated / Pricing Flexibility	December-01	1	1	0.37	0.37	0.18	0.18
19 Maine	Verizon			3	0	0.40	0.40	(0.22)	0.40
20 Maryland	Verizon			6	0	0.25	0.40	(0.52)	0.40
21 Massachusetts	Verizon			10	10	0.34	0.34	(1.40)	(1.40)
22 Michigan	SBC	Pricing Flexibility	February-01	5	5	0.45	0.45	(0.70)	(0.70)
23 Minnesota	Qwest	Competitive	December-98	1	1	0.55	0.55	0.27	0.27
24 Mississippi	BellSouth	Regulated/ Pricing Flexibility	January-96	0	0	0.78	0.78	0.78	0.78
25 Missouri	SBC	Regulated		0	0	0.55	0.55	0.55	0.55
26 Montana	Qwest	Competitive	December-00	3	0	0.95	0.95	(0.51)	0.95
27 Nebraska	Qwest	Deregulated	April-86	0	0	1.25	1.25	1.25	1.25
28 Nevada	SBC	Regulated		3	0	0.50	0.50	(0.27)	0.50
29 New Hampshire	Verizon	Regulated		5	5	0.40	0.40	(0.63)	(0.63)

30	New Jersey	Verizon	Competitive		4	0	0.20	0.75	(0.21)	0.75			
31	New Mexico	Qwest	Regulated		0	0	0.66	0.66	0.66	0.66			
32	New York	Verizon	Regulated		0	0	0.45	0.45	0.45	0.45			
33	North Carolina	BellSouth	Regulated		4	4	0.52	0.52	(0.55)	(0.55)			
34	North Dakota	Qwest	Nonregulated	January-99	0	0	1.25	1.25	1.25	1.25			
35	Ohio	SBC	Regulated		0	0	0.30	0.30	0.30	0.30			
36	Ohio/Indiana/Kentucky	Cincinnati			0	0	0.44	0.44	0.44	0.44			
37	Oklahoma	SBC	Regulated		5	5	0.45	0.45	(0.70)	(0.70)			
38	Oregon	Qwest	Regulated		2	2	0.50	0.50	(0.01)	(0.01)			
39	Pennsylvania	Verizon	Regulated		2	0	0.50	0.57	(0.01)	0.57			
			Service Group										
			IV										
40	Rhode Island	Verizon	(competitive)		5	3	0.50	0.50	(0.78)	(0.27)			
			Pricing										
			Flexibility/										
41	South Carolina	BellSouth	Competitive	January-96	3	0	0.95	0.95	(0.51)	0.95			
42	South Dakota	Qwest	Competitive	December-99	0	0	1.25	1.25	1.25	1.25			
43	Tennessee	BellSouth	Regulated	July-95	6	6	0.29	0.29	(0.60)	(0.60)			
			Pricing										
44	Texas	SBC	Flexibility		3	0	1.25	1.25	(0.67)	1.25			
45	Utah	Qwest	Competitive	October-99	0	0	0.95	0.95	0.95	0.95			
46	Vermont	Verizon			3	0	0.64	0.64	(0.34)	0.64			
47	Virginia	Verizon			3	3	0.29	0.29	(0.16)	(0.16)			
48	Washington	Qwest	Competitive	April-99	1	0	1.25	1.25	0.61	1.25			
49	Washington, DC	Verizon			5	0	0.36	0.36	(0.56)	0.36			
			Subject to										
			Competition										
50	West Virginia	Verizon	(III)		2	0	0.50	0.50	(0.01)	0.50			
			Pricing										
			Flexibility										
51	Wisconsin	SBC			0	0	0.95	0.95	0.95	0.95			
52	Wyoming	Qwest	Nonregulated	November-95	0	0	1.25	1.25	1.25	1.25			
<b>Average Number of</b>					<b>Average Regional</b>								
<b>Calls per Access Line</b>					<b>Price per Call<sup>3</sup></b>					<b>\$</b>	<b>0.43</b>	<b>\$</b>	<b>0.60</b>
<b>1.95</b>					<b>Median Regional</b>					<b>\$</b>	<b>0.22</b>	<b>\$</b>	<b>0.55</b>
					<b>Price per Call</b>					<b>\$</b>	<b>0.22</b>	<b>\$</b>	<b>0.55</b>

**NOTES:**

1.95 DA calls per month represents the average number of calls made per access line in the U.S. The average number of calls per month was calculated by dividing the total number of local DA calls reported by Frost & Sullivan for year 2000 by the total number of switched U.S. access lines reported by the FCC as of December 31, 2000.

<sup>1</sup> Average price per call: [ (Average Number of Calls per Month per Access Line - Residence Call Allowance)

\* Residential Price per Call / Average Number of Calls per Month per Access Line]

<sup>2</sup> Average price per call: [ (Average Number of Calls per Month per Access Line - Business Call Allowance)

\* Business Price per Call / Average Number of Calls per Month per Access Line]

<sup>3</sup> The average regional price per call calculation accounts for negative prices as zero.

**SOURCES:**

Data on price per call and exemptions obtained from Telcordia and the major ILECs.  
Regulatory status information obtained from Telcordia (February 2002) and the major ILECs.  
Frost & Sullivan, "Market Engineering Research for the U.S. Wireline Directory Assistance Services Market 1996-2006 6044-63," 2000, p. 47  
Federal Communications Commission Common Carrier Bureau Industry Analysis Division, "Local Telephone Competition: Status as of December 31, 2000," May 2001, table 1

## DA State Exemptions

State (a)	Type Exemptions: (b)
1 Alabama	Handicapped-residence
2 Arizona	Special Needs- Certified Impaired Vision/Motion
3 Arkansas	Physical, Visual, Mental Reading Disabled, Hospital
4 California	Disabled, Hospital, Physically Imp- Certified
5 Colorado	Special Needs- Certified Impaired Vision/Motion
6 Connecticut	Disabled
7 Delaware	Hospitals, Disabled
8 Florida	Handicapped
9 Georgia	Handicapped
10 Hawaii	Disabled, Coin, Hospital
11 Idaho (Northern)	Hospital, Special Needs- Certified Impaired Vision/Motion
12 Idaho (Southern)	Special Needs- Certified Impaired Vision/Motion
13 Illinois	Certified, Hospitals, Disabled
14 Indiana	Disabled, Hospitals, Area Code Request By Opr for Cust.-Long Dist., Hospital - Local, Hospital-long
15 Iowa	Special Needs- Certified Impaired Vision/Motion
16 Kansas	Physical, Visual, Disabled, Lack of Literacy-Calling Card Provided to Disabled
17 Kentucky	Handicapped, Error in Directory
18 Louisiana	Handicapped -- Residence & Business, Hospital, Hotel/Motel
19 Maine	Disabled
20 Maryland	Hospitals, Disabled
21 Massachusetts	Disabled, Coin, State Govt., Political Sub-Div, Elderly, Non-Pub/Non-List, Public Access Smart-Pay Lines, Public Access Lines
22 Michigan	Disabled, Hospitals, Hotel, Motel, Physical/Mental Limitations-Certified Special Needs- Certified Impaired
23 Minnesota	Vision/Motion, Hospitals
24 Mississippi	Handicapped, Hospital, Hotel/Motel, Error in Directory
25 Missouri	Physical, Visual, Mental Reading Disabled-Calling Card Provided
26 Montana	Special Needs- Certified Impaired Vision/Motion

27 Nebraska	Special Needs- Certified Impaired Vision/Motion
28 Nevada	Disabled, Coin
29 New Hampshire	Disabled
30 New Jersey	Hospitals, Disabled, Hotel/Motel, Mobile Phone
31 New Mexico	Special Needs- Certified Impaired Vision/Motion,hospitals, nursing homes
32 New York	Disabled, Inmate Public Access Lines, Hospital Patient Lines, Hotel/Motel Guest Lines, Centrex Dormitory Service, Mobile Type 1 Service
33 North Carolina	Handicapped, Public Telephones (1st 25 local DA calls free each month)
34 North Dakota	Special Needs- Certified Impaired Vision/Motion
35 Ohio	Impaired-Certified, Extension to Phone Used by Handicapped Limit 100 Calls/Mo.No Charge, Hospital - Local, Hospital-Long, Nursing Home, Public;Semi-Pub, COCOT Telephones
36 Oklahoma	Physical, Visual, Mental Reading Disabled, Hospital
37 Oregon	Disabled, Special Needs- Certified Impaired Vision/Motion
38 Pennsylvania	Hospitals, Disabled NDA-Coin, Dormitory Centrex, Hotel/Motel, Pay Telephone Lines, Mobile Type I Service
39 Rhode Island	Disabled, Hospital, NP/NL Credit
40 South Carolina	Hospitals, Hotels, Handicapped, Public Telephone
41 South Dakota	Special Needs- Certified Impaired Vision/Motion
42 Tennessee	Handicapped, Elderly (>65)
43 Texas	Hospitals, Coin, Disabled, Physical, Visual, Disabled-Calling Card Provided, Public Telephone, Certified
44 Utah	Special Needs- Certified Impaired Vision/Motion
45 Vermont	Disabled, Hospital
46 Virginia	Hospitals, Disabled, NDA-Disabled, Exception-Dorm (8 CA per 3 stations) Disabled, Coin, Hotel/Motel, Hospital, Special Needs- Certified Impaired
47 Washington	Special Needs- Certified Impaired Vision/Motion

48 Washington, DC	Disabled
49 West Virginia	Disabled, Hospital
50 Wisconsin	Disabled, Blind, Certified Special Needs- Certified Impaired
51 Wyoming	Vision/Motion

**SOURCES:**

Telecordia, September 2000  
BellSouth, SBC, Qwest, and Verizon